REES

CYCLOPAEDIA

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VER-WAT


NUNQUAM NON PARATUS

THE

CYCLOPÆDIA;

OR,

Universal Dictionary

OF

ARTS, SCIENCES, AND LITERATURE.

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BY

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CYCLOPÆDIA:

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OF

ARTS and SCIENCES.

VERMES.

VERMES, in *Anatomy* and *Physiology*. We have explained, under CLASSIFICATION, the objections to which the Linnæan clafs of Vermes is liable, confidered as one of the great divifions of the animal kingdom; and we have propofed, in place of it, an arrangement grounded on the diftinctions of anatomical ftructure, and therefore better fuited to the purpofes of comparative anatomy, as well as more conformable to natural method. As the anatomical defcription of the MOLLUSCA (which order includes moft of the Linnæan vermes) could not be prepared in time to appear under that word, it has been deferred to the prefent article, which will include alfo an account of the claffes VERMES and ZOOPHYTA. In his "Handbuch der Naturgefchichte," Blumenbach retains the Linnæan term VERMES, dividing the clafs into, I. Inteftina; II. Mollufca; III. Teftacea; IV. Cruftacea (Echino-dermata, Cuvier); V. Corallia (Zoophytes of moft naturalifts); and VI. Zoophyta (chiefly microfcopic animals and the animalcula infuforia).

In the following article we fhall employ the terms MOLLUSCA, VERMES, and ZOOPHYTA, not in the acceptation in which they are ufed by Linnæus or Blumenbach, but as they are explained in the article CLASSIFICATION;—the fame fenfe in which they are ufed by the French naturalifts generally, and by Cuvier particularly, in his moft valuable and ufeful works, the "Tableau élémentaire" and "Leçons d'Anatomie comparée."

When, in defcending along the fcale of living beings, we arrive, after the clafs of fifhes, at the invertebral animals, or fuch as have no vertebral column, we enter on an immenfe feries of various creatures, the moft numerous, and at the fame time the moft curious and interefting in refpect to the difference of their organization and faculties.

At this point in the fcale, the vertebral column is annihilated: as this column is the bafis of the fkeleton, the latter no longer exifts; and confequently the moving parts no longer have their points of action on internal organs.

Moreover, no invertebral animal breathes by means of cellular lungs: none have any vocal organ, nor confequently voice. They appear, at leaft for the moft part, not to have true blood; that is, not to have a fluid undergoing a true circulation, and poffeffing, as one of its effential characters, the red colour. It would be an abufe of words to call the colourlefs fluid, which moves flowly in the cellular fubftance of polypes, blood. We might as well give that name to the fap of vegetables.

This conftant and ftriking difference of colour in the nutritive fluids has been adopted, by fome zoologifts, as the bafis of their firft great divifion of the animal kingdom. The primary divifion into red-blooded and white-blooded correfponds with that into vertebral and invertebral animals.

The eye has no iris in invertebral animals. They have no kidney.

In the vertebral claffes, and particularly in the firft, or that of moft complicated and perfect organization, all the effential organs are infulated, occupying diftinct and feparate fituations; in the invertebral, they are all brought together.

In his "Tableau élémentaire," Cuvier introduces us to the Zoophytes as the laft or moft fimple of the animal kingdom in their organization and faculties. The Mollufca poffefs nearly the fame apparatus of organs for digeftion, circulation, refpiration, and fenfation as red-blooded animals; and they even come very near in thefe points to fifh. Infects, occupying a lower rank in the fcale, have no diftinct circulation, and refpire by tracheæ. Yet they poffefs a fpinal marrow, nerves, and organs of fenfe. In moft vermes we recognife analogous parts, and they probably exift in all. But, in the zoophytes, we no longer difcern thefe organic apparatufes;

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apparatuses: there are, in a few, barely digestive viscera, and some indications of respiration. They have no circulation, no nerves, no centre of sensation: each part of the body seems to imbibe immediately the materials of its nutrition, and to possess, within itself, the power of sensation.

Hence most of these animals have very strong reproductive powers, quickly restoring injured or lost parts. Some of them indeed are multiplied by a simple division, like plants. There are however different degrees in this simplicity, which is common to all. We pass successively from beings, which have feet, tentacula, hard and soft parts, and distinct viscera (*viz.* the Echino-dermata), to others, whose whole body is a gelatinous mass variously shaped (Medusæ), or, when examined with the most powerful microscope, presents an apparently indivisible atom (Infusoria).

Stagnant water, infusions of vegetable substances, the recent seminal fluids of animals, &c. teem with animated points, round, oval, or of other figures, with or without a small appendix forming a tail, only visible, for the most part, by means of strong magnifying powers.

In the arrangement of Lamarck these creatures form a distinct class, with the name Infusoria. As they are merely microscopic objects, we can only say of them, that they are minute, gelatinous, semitransparent points, in some of which more opaque spots are visible, homogeneous, irritable throughout, and contracting in every direction; consequently changing their form frequently, but generally assuming, when at rest, a determinate figure in each species. We consider that these little bodies, which are mere animated points, and constitute, if we may use such an expression, the ultimate term of organization (ultimate at least to our means of research), are nourished by absorption from their whole surface, and are probably excited by the surrounding influences of caloric, electricity, &c. Thus they resemble vegetables, which live by absorption, executing no digestion, and performing organic motions in consequence of external excitation. But the infusoria are irritable and contractile, and execute sudden motions, which they can repeat: this characterizes their animal nature.

The genus Monas of Cuvier, or Chaos of Blumenbach, includes the simplest known animals. The latter author divides his Chaos into aquatile, infusorium, and spermaticum, according as the animals are found in water, in vegetable infusions, or in animal semen. For a description of the latter, we refer to the article GENERATION; some of the former are noticed under ANIMALCULE. The Volvox is a round, yellowish or greenish, gelatinous, and nearly transparent animalcule, which swims round and round, and moves about without any visible organs of motion. It (volvox globator) abounds in summer in the water of marshes, and then has a reddish colour. In its interior we can distinguish globes similar to itself, which come out of its body, move about in the same way, and are seen to contain other smaller ones; so that the animal may be said to be pregnant at once with several successive generations. The volvox conflictor is found in the water of dunghills, and moves by turning alternately to the right and left. It contains internally round molecules, which move about also.

The appearance of these animalcules, their motions, and the multiplication of some species, lead us to ascribe them to the animal kingdom; but doubts are entertained on the subject. In that sense, at least, we understand the remark of Cuvier, "On seroit même tenté de croire que plusieurs de ces animaux microscopiques ne se forment que de la décomposition des matières soumises à l'infusion." Tab. Element. p. 663.

They who believe them to be animals, are again divided in opinion respecting the mode of their production; some arguing from analogy that they are produced by generation of some kind, while others admit of a spontaneous origin, or what has been commonly called *equivocal generation*. Spallanzani made several experiments to determine this point. Long boiling accelerated the production of the animalcules; which were also produced from the infusion of vegetable seeds burnt with the blowpipe. When boiling infusions were put into glass tubes, and these immediately hermetically sealed, no animalcules were produced. Electricity, tobacco-smoke, oleaginous, spirituous, and corrosive liquors destroy them. They will live a month in vacuo; but are not produced in that situation. Spallanzani's Tracts on Animals and Vegetables.

Respecting this doctrine of equivocal generation, we may observe, that the only argument in its favour is the indirect and unsatisfactory one arising from its opposers being unable to shew that the creatures in question are produced by a process of generation. The analogy of all nature, down to the minutest insects, which our microscopes enable us to investigate, affords a very strong presumptive proof against it, and leads us to conclude, that if our means of examination were more perfect, we should find that these creatures are produced and multiplied like all other animated beings.

There are numerous other species named after differences of form, or according to the circumstances under which they are produced. The Proteus has the singular property of changing its form, almost incessantly, into every possible modification of figure. The small animals found in vinegar and paste (Vibrio aceti et glutinis), generally called eels from their elongated figure, are almost large enough to be distinguished by the naked eye. Freezing does not destroy them; but evaporation does, unless they are protected by a little dust from the contact of the air. It is said that they change their skin, that they have different sexes, and produce young ones alive in spring, then lay eggs till autumn.

The genera just enumerated, *viz.* Monas, Volvox, Proteus, Vibrio, together with two others, Bursaria and Kolpoda, make up the order infusoria nuda of Lamarck; that is, such as have no external appendices. He has a second order of infusoria appendiculata, including such infusion animalcules as exhibit any prominent part like hairs or tail, &c. The seminal *vermiculi*, as they have been termed, (cercariæ, Lamarck,) belong to this order, for they have a tail.

It includes also the genus or family of the tricho-cercæ and trichodæ.

We come next to animalcules a little more complicated in their structure: they possess stellated organs, consisting of fine ciliated processes surrounding an opening, and susceptible of motion, with the supposed object of drawing their prey towards the aperture.

The following animals are formed by Lamarck into an order which he calls Polypi, and which we deem a very natural one. They are gemmiparous, or multiply by shoots. They have a small elongated body, homogeneous, gelatinous, very irritable, possessing wonderful reproductive powers, provided at its upper end with a mouth, which is surrounded by rotatory organs, or radiated tentacula, and serves as the entrance of an alimentary cavity which has no other opening. This cavity is the only organ they possess; it is usually an elongated bag, seldom folded on itself, or possessing any appendages. Such is the idea of a polype: when several of these little bodies are connected together, and participate a common life, they compose the animals of zoophytes.

The

The idea, which some have entertained, that the brain and nerves, the muscular system, &c. of which no trace can be discovered in the polypi, nevertheless exist, but are expanded and as it were melted down into the general mass of the body, so that every point is capable of sensation, muscular motion, &c. is a perfectly gratuitous and improbable supposition. On this view, it would follow that a fresh-water polype (hydra) has all the organs of a perfect animal in every part of its body, and consequently sees, hears, smells, &c. at all points. Thus it would be a more perfect animal than man, as each molecule would be equivalent, in the complement of its organization and faculties, to an entire individual of the human species. If we allow this to the polype, how can we refuse it to the monas, to vegetables? The study of nature teaches us in all cases, that when an organ ceases to exist, the faculty is no longer found.

The polypi are very irritable, and are acted on by external influences. Light attracts them towards the quarter whence it comes, as it does the branches, flowers, and leaves of plants. No polype pursues its prey; but when a foreign body touches its tentacula, they stop and convey it to the mouth; it is swallowed without distinction, digested if susceptible of that process, otherwise rejected.

Lamarck objects to the term zoophytes, or animal plants, because these are truly animals, and have nothing of vegetable nature. The only relations between polypi and plants are in the simplicity of their structure, in the connection of several polypi with each other, so as to communicate by their alimentary canal, and form compound animals; and in the external form of the masses which these united polypi compose, a form which for a long time caused them to be taken for true vegetables, since they are often ramified nearly in the same manner. Whether polypi have one or more mouths, we must always bear in mind that they lead to an alimentary cavity, that is, to an organ of digestion which does not exist in any vegetable.

The wheel animal of Spallanzani is a remarkable species of this kind (rotifer redivivus; vorticella rotatoria, Gmel.) It is found in stagnant water, and in the sand of sewers and tiles. It has a tail, and is forked in front; each portion bearing a kind of toothed wheel, which can be drawn in at pleasure. Internally an organ is perceptible with a slow and irregular motion, supposed to be a stomach.

The name of redivivus was given to this creature from its remarkable property, pointed out by Spallanzani, of recovering life after being long dried. This resuscitation will take place at the end of some years; but Spallanzani says, that the animal must be kept in the sand in which it is found. (See his Tracts.) Baker (on the Microscope) makes a similar representation with respect to the eels of blighted corn.

The vorticellæ of Cuvier, polypes à bouquet, (Brachionus, Blumenbach,) have small organs, like fine hairs, coming out of their anterior extremities, turning about rapidly and incessantly: their nature and use are unknown. Some have a tail; others a thread-like peduncle. The latter are united in an arborescent manner. They inhabit stagnant waters, and are so minute, that a mass of them appears only as a spot of film. They multiply by simple division, one of the small bodies splitting, and each half becoming an entire one.

The botrylli, corinæ, and cristatellæ, or polypes à plumet of Cuvier, are allied to the latter: they possess tentacula or ciliated organs; and are either single or collected into arborescent masses.

In the fresh-water polypes (hydra), the organization is rather more complicated, and the size of the animal increases, so that it is visible with the naked eye. They are gelatinous, semi-transparent, and therefore not easily recognised by a person unaccustomed to look for them. Their body is elongated, small at one end, by which it is attached to some aquatic plant, testaceous animal, &c. and larger at the other. It consists of a cavity terminating at the large end by a round orifice, surrounded by long tentacula. The animal indeed may be regarded as a stomach, provided with instruments for catching its food: the latter is the use of the tentacula. The substance of the body appears, under the strongest magnifying powers, a mere jelly, with more opaque portions interspersed. Blumenbach compares it to boiled sago. They live on naiades, monoculi, and other small aquatic animals, which they seize with their tentacula, and convey into the stomach, where they are digested, and from which the refuse is rejected by the same opening.

They perform locomotion, and seem very sensible to light, although nothing like muscle or nerve can be discerned in them. Neither have any vessels been seen in them: they are said indeed to receive a tint from the food they take, so that it must pass immediately from the stomach into the organs.

The most surprising circumstances, however, in these animals, are their mode of multiplication and their extensive power of reproduction. They propagate by buds from their own body. If cut into six or more pieces, each becomes a perfect animal: they may be inverted, and the external and internal surfaces will be changed and assume each other's functions. When they are partially divided in the longitudinal direction, the separated parts heal so as to form two heads or tails, &c. See the article POLYPE; also, Trembley Mem. pour servir à l'Histoire d'un Genre de Polypes d'Eau douce, &c.; Leid. 1744. 4to. Baker's Natural History of the Polype; Lond. 1743, 8vo. Rösel Historie der Polypen; in the third volume of his Insectenbelustigungen. Schäffer Armpolypen in den süssen Wassern um Regensburg, 1754, 4to.

From the fresh-water polypes, there is an easy transition to the animal of the West India islands described by Ellis, in the Phil. Trans. vol. lvii. tab. 19. fig. 1, and in his Natural History of Zoophytes, tab. 1. fig. 1, under the name of actinia sociata, or cluster animal flower. It is the zoanthe à dragеons of Cuvier, hydra sociata of Gmelin. It is of a tender fleshy substance, consisting of many distinct tubular bodies, each of which swells above into a small bulb: at the top of this bulb is the mouth, surrounded by one or two rows of tentacula, which can be extended or withdrawn at pleasure: in the latter state they look like circles of beads. These bodies are connected below to a firm fleshy wrinkled tube, sticking fast to the rocks, and sending forth other fleshy tubes, which creep along them in various directions, and give origin to similar bodies rising up irregularly in groups. Knobs are observed on the adhering tube, from its insinuating itself into the inequalities of the coral rock. When the animal is dissected lengthwise, a large cavity is exposed, into which a tube opens from the mouth. From this tube eight small cords arise, continued to the lower part of the animal, where they seem to be lost in the fleshy basis.

The small polypi will appear to us more wonderful, and will more powerfully engage our attention, when we find that they produce all those marine substances, formerly called zoophytes, from a notion that they partook both of the animal and vegetable natures, and including corals, corallines, madrepores, millepores, sponges, &c. &c. So active are these minute creatures in some parts of the ocean, that

that their constructions form the basis of new islands, constitute extensive and dangerous reefs, block up harbours, create shoals, &c. All which effects are produced by animals not greatly exceeding in bulk the fresh-water polype.

It has been repeatedly found in the West Indies, that wrecks become covered universally and thickly with madrepores and other corals within three-quarters of a year. The formerly excellent harbour of Bantam is now almost entirely occupied by corals. Several volcanic isles of the South-sea, and some even of the West Indian, as for example Barbadoes, are coated over with coral. The dangers to navigators from great coral banks rising out of the bottom of the sea, in unknown tracts, may be illustrated from what Cook and Flinders experienced on the coasts of New Holland.

These productions were formerly described with vegetables, and they will be found so classed by Tournefort: their vegetable nature was even defended by Pallas. Our countryman Mr. Ellis has the honour of demonstrating that they belong to the animal kingdom, and of shewing the animals by which they are formed. See his papers, accompanied by plates, in the 48th, 49th, 50th, 53d, 55th, and 57th vols. of the Phil. Transf.; also his admirable works, "Natural History of Corallines," &c. Lond. 1755, 4to.; "Natural History of many curious and uncommon Zoophytes," &c. 1786, 4to. See also Donati della storia Naturale Marina dell' Adriatico; Venez. 1750, 4to.; Cavolini Memorie per servire alla storia de Polipi Marini; Napol. 4to.

The animals belonging to these substances may be called compound polypi. The fleshy masses, which are differently circumstanced in different cases, exhibit numerous projecting heads, each of which has a mouth with radiated tentacula. These heads may be either extended or withdrawn. Thus all the polypi are connected into one mass, which is increased by shoots. In structure, these compound polypi do not differ from the simple ones, so far at least as our present knowledge of them goes.

Some zoophytes consist of a horny tube, branching out variously, and hollow internally. The axis of these zoophytes is occupied by a stem of animal substance, and at each of its branches a polype projects. The horny covering probably grows as the shells of the testacea do: and we may suppose, that the tentaculated heads of the animal serve to procure it nourishment. The flosculatia is of this kind: the animal is not very intimately connected to the tube.

The tubularia occurs in fresh water as well as in the sea; there is a horny tube, sometimes simple, sometimes ramified. The polype at the end exhibits tentacula, or a bundle of hairs like a pencil. The capsularia and sertularia are of the same kind.

In other instances, each polype, instead of being connected to a common stem, is contained in a horny or calcareous cell, with thin sides. In these there is not the same direct communication as in the former genera. Each polype is insulated, or, if they communicate, it must be by very fine filaments, traversing the cells.

In these and some other of the zoophytes, vesicles are occasionally seen, and have been supposed to be ovaries: the latter opinion, however, is inconsistent with the views entertained at present. Cellularia, flustra, and corallina, exemplify this: though, with respect to the latter, it must be observed, that its animals have not yet been demonstrated, and its pores are so small, that they must be extremely minute.

The zoophytes which have an axis of solid substance, covered by a soft fleshy layer, with hollows, which contain tentaculated polypi, have been called cerato-phyta. The axis is sometimes ligneous or horny, or stony, and covered by a fleshy substance capable of contracting. In this there are numerous hollow tubercles, from which there are projected and withdrawn at will, heads, or rather tentaculated mouths formed like polypi, all belonging to the same animal, like the branches of a polype: that is, the soft substance covering the solid axis is to be regarded as the animal, of which these are so many mouths. It has the power of extending itself to form a basis of adherence to solid bodies. We also observe it extending over and forming a new stratum of coralline matter, inclosing foreign bodies that may be attached to the axis. That the coralline axis is formed by the fleshy covering cannot be doubted; we perceive in it concentric strata, indicating its successive depositions, and the surface is marked by longitudinal lines corresponding to the figure of the animal covering. When the trunk of the coralline tree contains ligneous or vegetable matter, probably this is an extraneous body, on which the coral is deposited. The branches are produced by an elongation of the soft flesh, which forms them in its interior: but their strata are not continuous with those of the trunk, as in the case of trees.

Cuvier (Tableau élémentaire, p. 671.) states, that the nourishment taken by any of the polype heads is converted to the use of the whole animal; to which, also, he ascribes a common will, as evidenced by its extension for the purpose of adhering to surrounding objects. We know no facts concerning the structure of the animal covering, at all sufficient to warrant these statements.

The gorgonia nobilis (isis nobilis), or red coral, is an example of this structure. The axis is the compact stony substance, of the hardness of marble, of which coral ornaments are made. The fleshy covering is of a bright red, containing calcareous molecules, which form a kind of incrustation when dried, and exhibiting numerous cavities in which polypi are lodged. Each of these has eight denticulated tentacula. The antipathes and isis belong to this division. See the excellent plates of Ellis in the Natural History of Zoophytes, exhibiting all the facts above enumerated; particularly tab. 3. fig. 1—5. for various views of the isis hippuris, or black and white coral: tab. 11. gorgonia flammea: tab. 12. figs. 1, 2. gorgonia ceratophyta: tab. 13. figs. 3, 4. gorgonia pectinata: tab. 14. figs. 1, 2. gorgonia briareus: fig. 3. gorgonia pinnata.

The pennatula, or sea-feather, belongs also to this division, and it is remarkable among the marine zoophytes, as being unattached, and possessing the power of locomotion. All the others are fixed by their trunks or bases to some other object, as rocks, shells, sea-weed, &c. &c.

The pennatula resembles a feather, and consists of a shaft and barbs. The former is cartilaginous and covered by a fleshy layer; from which, at its smaller half, forty, sixty, or more curved arms proceed on both sides, like the barbs of a feather. Ten, twelve, or more smaller processes are continued from one edge of each of these primary barbs; and in each of these is contained a delicate gelatinous polype, with eight tentacula.

"The stem of the suckers of this animal," says Mr. Ellis, "is of a cylindrical form: from the upper part proceed eight fine white filaments or claws to catch their food; when they retreat on the alarm of danger, they draw themselves into their cases, which are formed like the denticles in the corallines; but here each denticle is furnished with spiculæ, which close together round the entrance of the denticle, and protect this tender part from external injuries." Phil. Transf. vol. liii. p. 424.

Thus,

Thus, in a feapen of a fpan long, there are at leaft above 500 of thefe polypes. (See Ellis, Zoophytes, p. 6. et feq. tab. 8.) They fwim about in the fea by a common motion produced by their numerous polypi; and are remarkable for poffeffing phofphoric properties; hence one kind has been called pennatula phofphorea, and Linnæus fays of it, "habitat in oceano, fundum illuminans." (Phil. Tranf. vol. liii. tab. 19. fig. 1—5.) The pennatula rubra, or Italian feapen, is alfo ftrongly phofphoric. Dr. Shaw obferves of it, that on the coaft of Algiers it fends forth fo great a light in the night, that the fifhermen can diftinguifh the fifh as they fwim by it, fo as to know where to caft their nets. See Phil. Tranf. vol. liii. p. 21. figs. 1, 2.

The foft covering of the ftem of the feapens confifts externally of a ftrong coriaceous membrane, and internally of a thinner membrane: the cavity of the latter is occupied merely by the bone or cartilage. Between the two membranes are innumerable yellowifh eggs, floating in a whitifh liquor. The fins are alfo compofed of two fkins; the outer ftrong and leathery, the inner thin and clear. The cylindrical part of the fuckers is formed in the fame way, except that their outward fkins are fofter. Both the fins and fuckers are hollow; fo that the cavity of the fuckers may communicate with their fins, as their cavity does with the trunk.

See an account of the feapen or pennatula phofphorea of Linnæus; likewife a defcription of a new fpecies of feapen, found on the coaft of South Carolina, with obfervations on feapens in general, by J. Ellis, in the Phil. Tranf. vol. liii. with three plates reprefenting various fpecies, with magnified views of the fins and polypes.

The lithophytes are zoophytes with an axis or bafis of a ftony fubftance, in which receptacles for polypi are excavated. The madrepores and millepores belong to this divifion. See Ellis's Zoophytes, tab. 23. for views of the millepora truncata, in which the polypes are feen magnified. They are fo numerous in fome feas, as to form entire iflands: feveral of thofe in the South-fea are a mere congeries of madrepores.

The laft kind of zoophytes have a fpongy friable or fibrous fubftance for their bafis, covered by a flefhy incruftation, which fometimes contains polypes. There are only two genera; *viz.* alcyonium and fpongia. The interior of the latter is light, friable when dry, compofed of fine, diverging fibres. The animal covering is a foft incruftation, without calcareous particles, which becomes coriaceous by drying, and is pierced with cells from which the heads of polypes iffue. See Ellis in the Phil. Tranf. vol. liii. tab. 20. figs. 10. 11. and 13.

Whether the fponges are animals, is ftill doubted even by good naturalifts: at all events, they poffefs the characters and faculties of animals in the loweft degree. They confift of a more or lefs denfe and flexible fibrous tiffue, covered in its recent ftate by a femifluid and thin kind of animal jelly. Regularly formed round apertures are obferved, fometimes pierced in flightly prominent papillæ; but no polypes iffue from thefe, nor has any thing of the kind ever been feen in them. The only circumftance mentioned about them, that can be deemed a fign of life, is a flight and hardly perceptible contraction or fhrinking, when they are torn from their fituation. After their death, the animal jelly diffolves and is removed, and the fibrous bafis alone is left. See Ellis on the Nature and Formation of Sponges, Phil. Tranf. vol. lv. pl. 10 and 11.

Next to the polypes, whether exifting fingly and uncovered, or connected with thofe conftructions which conftitute the zoophytes, we may place, in refpect to fimplicity of ftructure, the actiniæ and medufæ. The former poffefs a coriaceous body, with confiderable power of contraction, which enables the animal to change its figure very remarkably, from a half fphere, when the mouth is fhut, and the tentacula withdrawn, to a cylinder when it is open. It adheres by a circular difk to the fand, rocks, &c. The oppofite end forms a mouth, furrounded by feveral rows of long, conical, and moveable tentacula, which can be withdrawn or extended at pleafure. The mouth is round, and leads ftraight into a cylindrical ftomach, with rugous fides. They live on fmall crabs principally, which they feize and envelop with their tentacula. The refufe is rejected by the fame paffage. Between the parietes of the ftomach and the fkin there is a vaft number of very fine inteftines, interwoven with each other, of which the communications and ufes have not been found out.

The actiniæ are famous for their reproductive powers. When cut in two, each part becomes a perfect animal. The tentacula and other parts are eafily reftored. The young actiniæ are born alive, either at the mouth or through the fide of the parent; in the latter cafe the cicatrix foon clofes. They move fometimes on their bafis, fometimes on the tentacula.

Lamarck's clafs of polypi terminates with the actiniæ. It includes the following orders:

I. Polypes rotifères (wheel-bearing), having ciliated and rotatory organs round the mouth. Urceolariæ. Brachioni. Vorticellæ.

II. Polypes à polypier,—polypes connected with hard fubftances; having radiated tentacula about the mouth, and connected to a hard fubftance, which does not float loofe in the water.

1. With membranous or horny polypier, without any diftinct cortex. Criftatella. Plumatella. Cellularia. Sertularia. Fluftra. Cellepora. Botryla.

2. Polypier with a horny axis, covered by an incruftation. Acetabulum. Corallina. Spongia. Alcyonium. Antipathes. Gorgonia.

3. Polypier with an axis partly or entirely ftony, and covered by a bark-like incruftation. Ifis. Corallium.

4. Polypier entirely ftony, and without incruftation. Tubipora. Lunulite. Ovalite. Siderolite. Orbalite. Alveolite. Ocellaria. Efchara. Retepora. Millepora. Agarica. Pavonia. Meandrina. Aftrea. Madrepora. Caryophyllia. Turbinolia. Fongia. Cyclolite. Dactylopore. Virgularia.

III. Polypes flottans; loofe polypi.

Polypier loofe, floating in the water, having a horny or offeous axis, covered by a flefhy inveftment, to which all the polypi are connected: radiated tentacula round the mouth of the latter. Funiculina. Veretilla. Pennatula. Encrinus. Umbellularia.

IV. Naked polypi; mouth with radiated tentacula, often multiplied; no polypier. Pedicellaria. Corina. Hydra. Zoanthus. Actinia.

The fubftance of the medufæ is tranfparent and gelatinous (whence their common name of fea-blubber), and almoft entirely deftroyed by evaporation or boiling. In the ftate of reft, their body reprefents the fegment of a fphere, with the convexity fmooth, and the oppofite furface furnifhed with various tentacula. Coloured lines are obferved in their interior, but nothing which indicates circulation. Towards their edges, however, numerous veffels are obferved, communicating apparently with the alimentary cavity. They inhabit the ocean, fwimming very well by rendering their

body

body alternately more and leſs convex. When the tide ebbs, many of them are left on the ſhore motionleſs. Although theſe creatures are very numerous, and in ſome inſtances of great bulk, their ſtructure and economy are hitherto but little known. Meſſrs. Péron and Le Sueur devoted their attention to them very particularly in their voyage to the Southern iſlands; have delineated ſome ſpecies in their "Voyage aux Terres Auſtrales;" and have announced a comprehenſive work on the whole tribe, in which their natural hiſtory and ſtructure are to be amply inveſtigated. Perhaps this has even now appeared; but we have not ſeen it. In the notice of this publication, given in the Annales du Muſéum d'Hiſtoire Naturelle, tom. xiv. p. 218. et ſeq. they obſerve, "that the ſubſtance of the meduſæ is reſolved entirely, by a kind of inſtantaneous fuſion, into a fluid analogous to ſea-water; yet the moſt important functions of life are exercifed in theſe bodies, which ſeem to be merely coagulated water. Their numbers are prodigious, yet we have no certain knowledge of their mode of generation: they are in ſome caſes ſeveral feet in diameter, and weigh fifty or ſixty pounds, yet their ſyſtem of nutrition eſcapes us: they execute the moſt rapid and continued movements, yet we can diſcover no fibrous or muſcular ſtructure: their ſecretions are exceedingly abundant, yet we ſee nothing of the mechaniſm by which they are executed: they have reſpiration of a very active kind, but its ſeat is a myſtery: they appear very feeble, yet fiſhes of ſome inches in length are their conſtant prey: their ſtomach ſeems incapable of any action on the latter animals, but they are digeſted immediately. Several of them contain air in their interior; we do not know how they can derive it either from the atmoſphere or water, or develope it in their inteſtines. Several are phoſphoric: they ſhine in the darkneſs of the night like ſo many globes of fire; yet the nature, the principle, and the agents of this ſtriking property are ſo many problems. Some ſting and benumb the hand which touches them: the cauſe of this phenomenon is equally unknown." The latter property, being one of the moſt obvious, has influenced the name of theſe beings: they are called in all languages, ſea-nettles.

In the ſame volume of the Annales du Muſéum, the authors quoted above have given a view of the generic and ſpecific characters of the meduſæ, as they will be deſcribed in their great work. See p. 325, et ſeq.

The echino-dermata of Cuvier are the moſt complicated in their ſtructure among the zoophytes: they have a coriaceous or calcareous covering, a diſtinct internal reſpiratory organ, and often numerous retractile feet. In many the ſkin is of a more or leſs cruſtaceous nature; or it may even be a true ſhell. The feet, paſſing through apertures of this covering, admit of being extended or withdrawn: they are often arranged with much regularity. There is a mouth, provided generally with five teeth arranged in a circle, and leading into an alimentary cavity in the interior of the body: there are alſo ovaries; and a very extenſive ramified organ, which ſeems to eſtabliſh a perpetual circulation of water through the bodies of theſe animals, and conſequently a kind of reſpiration. Nothing is found like heart or brain. The holothuria (ſea-cucumber), with its cylindrical body and thick leathery ſkin; the aſterias, with its conical radiated proceſſes and pliable calcareous integument; and the echinus (ſea-hedgehog), with a complete calcareous ſhell, belong to this diviſion.

The meduſæ, ſtar-fiſh, echini, &c. are formed by Lamarck into a diſtinct claſs, which he calls Radiaria, or radiated animals, becauſe their bodies are diſtinguiſhed, in the arrangement both of their internal and external parts, by being formed into radii ſurrounding a centre; a formation of which the firſt ſketch is ſeen in the polypes.

Their mode of generation is not exactly known, but they poſſeſs conſiderable powers of reproduction: they contain organs that ſeem like ovaries. The mouth is placed downwards, or on the inferior ſurface of the body: they have no head, eyes, nor articulated limbs, probably no nerves; and no circulating ſyſtem.

This claſs comprehends two orders:

I. Radiaria molluſca (ſoft radiant animals). Gelatinous body, ſoft tranſparent ſkin, without any articulated ſpines; no anus. Genera: Stephanomia. Lucernaria. Phyſſophorus. Phyſalia. Velella. Porpita. Pyroſoma. Beroe. Equorea. Rhizoſtoma. Meduſa.

II. Radiaria echino-dermata. Opaque cruſtaceous or coriaceous ſkin, furniſhed with retractile tubercles, or ſpines articulated upon tubercles, and perforated by rows of holes.

1. Stellerida. Skin not irritable, but moveable; no anus. Genera: Ophiurus. Aſterias.

2. Echinida. Skin not irritable, nor moveable; an anus. Genera: Clypeaſtrus. Caſſidites. Spatanguis. Ananchites. Galerites. Nucleolites. Echinus.

3. Fiſtulida. Body elongated; ſkin irritable and moveable; an anus. Genera: Holothuria. Sipunculus.

The vermes of Cuvier approach very much to the larvæ of inſects. Perfect inſects are diſtinguiſhed, among all the white-blooded claſſes, by the perfection of their organs of motion, their members having diſtinct articulations, and the component parts being ſolid. The larvæ in ſome caſes enjoy the ſame advantage: thoſe of the orthoptera and hemiptera have as perfect legs as the perfect inſects: in the larvæ of the lepidoptera and coleoptera, the members are generally very ſhort, and not capable of prompt motion. The limbs diſappear entirely in the larvæ of the diptera, and many of the hymenoptera, their place being ſupplied by hairs, briſtles, or merely by the rings and tranſverſe wrinkles of the trunk. The vermes reſemble the laſt mentioned larvæ; but they undergo no change of form.

The largeſt have the body divided into diſtinct rings: a knotted nervous cord is found in their interior. Thoſe which live in water, breathe by membranous or tufted branchiæ, like many aquatic larvæ. Others have along the ſides of their body ſtigmata preciſely ſimilar to the openings of the tracheæ in inſects. The organs of motion, in ſeveral inſtances, are ſtiff briſtles or ſpines. Others crawl by ſucceſſively wrinkling or contracting the different parts of the body. Some have even antennæ. In ſhort, we cannot aſſign any general character, drawn either from external form or internal ſtructure, which would be ſufficient, in all caſes, to diſtinguiſh worms from the larvæ of inſects.

Moſt worms inhabit the interior of other animals, as the larvæ of ſome inſects do: others live in the earth or water. Some of the latter conſtruct ſolid habitations, either by agglutinating foreign ſubſtances, or by pouring out a calcareous matter, like that of the teſtaceous molluſca. But the ſhells of worms may always be diſtinguiſhed from thoſe of the molluſca, becauſe they are always either ſtraight or tortuous tubes, never regularly ſpiral, or an expanded cone, and more particularly becauſe the animal is never attached, which it is almoſt invariably in the caſe of the molluſca.

This claſs of vermes has been divided by Lamarck into two; namely, worms, and annular animals (annelides). His claſs of worms contains the inteſtinal worms, and ſome others, whoſe organization is equally imperfect. The animals included in this claſs have a ſoft body more or leſs elongated,

gated, without head, eyes, or articulated limbs. They have no circulating veſſels. No organ of fecundation has been hitherto diſcovered; ſo that ſexual generation does not ſeem to exiſt in them. The parts ſuppoſed in ſome to be ovaries ſeem to be mere collections of reproductive molecules, which require no fecundation. Their inteſtinal canal is complete, or poſſeſſes two openings; and the mouth conſiſts of one or more apparatuſes for ſucking.

The claſs is divided into three orders; *viz.* cylindrical, veſicular, and flattened worms, according to the form of the body.

The claſs of annelides or annuloſa has a ſoft elongated body, covered by tranſverſe rings, and no articulated limbs: ſeldom a head or eyes. They have a knotted ſpinal marrow; arteries and veins containing a fluid, which is generally red. They breathe by branchiæ, which are ſometimes external and prominent, ſometimes concealed.

The claſs conſiſts of two orders:

I. Annuloſa crypto-branchia (having concealed branchiæ). Genera: Planaria. Hirudo. Lernæa. Clavala. Naias. Lumbricus. Thalaſſema.

II. Gymno-branchia (having external branchiæ). Genera: Arenicola. Amphinomia. Nereis. Terebella. Amphitrite. Sabellaria. Serpula. Spirorbis. Siliquaria. Dentalium.

The molluſca have a muſcular heart, to which the nutritive fluid is brought by the veins, and from which it is carried out by the arteries; they have organs nearly reſembling the gills of fiſh, in which the fluid is expoſed to the influence of the ſurrounding element, and glands which pour different ſecretions into the alimentary canal. They have a brain, nerves, and ſome organs of ſenſe; but in the latter there is more variety than in the other points. Their body, or at leaſt their limbs have no bone in the interior; but ſeveral of them are incloſed in very firm, even ſtrong caſes, which are called ſhells (teſtæ), whence the animals themſelves have been denominated teſtacea or ſhell-fiſh in common language. Theſe are comprehended, together with the entirely naked ones, under the name molluſca.

They have white and very irritable muſcles. They are extremely tenacious of life; moving after being cut into ſeveral pieces, and reproducing very conſiderable portions of their body when deſtroyed in any way. Their ſkin is always ſoft, and generally lubricated by a viſcous ſecretion: it is very ſenſible, and poſſeſſes organs, called tentacula, capable of elongation, for the purpoſe of touching. None have organs of ſmelling, but there are eyes in ſeveral, and ears in ſome. The body is generally enveloped, or at leaſt covered in great part by a membranous inveſtment, called in French *manteau*, which we ſhall term the mantle. Several have moreover a hard covering named a ſhell, compoſed of one or more pieces, called valves, and produced by calcareous matter tranſuding from the mantle. To this the body is fixed by means of muſcles. Moſt molluſca inhabit the ſea; ſome dwell in freſh water, and others live in the earth.

Lamarck removes four genera from the molluſca, to conſtitute a diſtinct claſs, which he calls cirrhipèdes: theſe genera are tubicinella, coronula, balanus, anatifa. Their principal diſtinguiſhing characters are articulated arms covered by a horny ſkin; two pairs of mandibles to the mouth; a knotted nervous cord.

It appears from the preceding review, if we join to it the conſideration of the ſtructure of inſects, that the animals with white blood, as they have been called, have not ſo many common characters as the red-blooded. Their chief diſtinctions are of the negative kind, as the abſence of a vertebral column, and of an interior articulated ſkeleton, &c.

"Thus," ſays Lamarck, "when we conſider ſucceſſively the various organic ſyſtems of animals, from the moſt compound to the moſt ſimple, we ſhall obſerve a *degradation* of the organization commencing even in the claſs which comprehends the moſt perfect animals, proceeding from claſs to claſs, though with anomalies cauſed by various circumſtances, and terminating at laſt in the infuſoria. The latter are the moſt imperfect, and moſt ſimply organized; the degradation in them has reached its term, the organization being reduced to a ſimple, homogeneous, gelatinous body, almoſt without conſiſtence, poſſeſſing no diſtinct organs, and ſimply formed of a very delicate tiſſue, which ſeems to be affected by the ſurrounding ſubtile fluids.

"We have ſeen each organ, even the moſt eſſential, gradually degenerate, become leſs diſtinct, and at laſt entirely diſappear long before we had reached the extremity of the ſeries: and we may obſerve, that it is principally in the invertebral animals that the ſpecial organs are obſerved to be annihilated.

"Before we quit the diviſion of vertebral animals, great changes are perceived in the perfection of the organs, and even ſome of them, as the urinary bladder, the organ of the voice, the eye-lids, &c. diſappear entirely. The lung, which is the moſt perfect apparatus for breathing, degenerates in reptiles, ceaſes to exiſt in fiſhes, and is not found in any invertebral animal. The ſkeleton itſelf, which furniſhes the baſis of the four limbs poſſeſſed by moſt vertebral animals, begins to decline, particularly in reptiles, and ends altogether in fiſh.

"But in the invertebral animals, we ſee the moſt important parts annihilated, one after the other: the heart, the brain, the branchiæ, conglomerate glands, circulating veſſels, the organ of hearing and of ſight, thoſe of ſexual generation, and even thoſe of ſenſation and motion. We ſhould ſeek in vain among the polypes for the ſlighteſt trace of nerves or muſcles: irritability alone ſupplies the place of ſenſation and voluntary motion. All the motions of a polype are the reſult of external excitation. Put a freſh-water polype (hydra) in a glaſs of water, and place this glaſs in a chamber, which receives light from one quarter only. It will ſlowly move itſelf towards the part on which the light falls, and will remain there. Vegetables turn themſelves towards the light in an analogous manner.

"Undoubtedly, wherever a particular organ no longer exiſts, the faculty which it exerciſed ceaſes alſo: the latter is alſo more obſcure in proportion to the deterioration of the organization. Inſects are the laſt, in the ſcale of animated nature, poſſeſſing eyes; we have reaſon to ſuppoſe that they ſee very obſcurely, and make but little uſe of their eyes.

"This degeneration may be obſerved, even in the nature and conſiſtence of the eſſential fluids, and of the fleſh of animals. The blood and muſcles of the mammalia and birds are the moſt compound and animalized of animal productions. After fiſh, theſe ſubſtances are progreſſively changed to ſuch a degree, that in the ſoft radiant animals, in the polypi, and particularly in the infuſoria, the nutritive fluid has merely the colour and conſiſtence of water, and the fleſh is a ſoft jelly, ſcarcely animalized." Philoſophie Zoologique, tom. i. p. 212, et ſeq.

The following Table, extracted from the ſame work of Lamarck, p. 277, et ſeq. exhibits the invertebral animals, arranged according to their ſtructure, with their principal characters, in a progreſſive ſeries, from the moſt ſimple upwards.

Animals

Animals without Vertebræ.

Classes.		Degrees.
I. Infusoria.	Generation by splitting of the body, or by shoots; body gelatinous, transparent, homogeneous, contractile, and microscopic: no radiated tentacula nor rotatory appendices; no special organ, not even for digestion.	1st. No nerves; no vessels; no internal and special organ, but for digestion.
II. Polypi.	Generate by shoots; body gelatinous, with great powers of regeneration; no internal organ, except an alimentary cavity with a single opening. Mouth at one end surrounded by radiated tentacula, or by ciliated and rotatory organs. They compose, for the most part, compound animals.	
III. Radiaria.	Suboviparous: great powers of reproduction; no head, eyes, nor articulated limbs; the form of the body radiated; mouth placed below.	2d. No knotted medullary cord; no circulating vessels; some internal organs besides those of digestion.
IV. Vermes.	Suboviparous; body soft, and highly reproductive; undergo no metamorphosis; no eyes, nor articulated limbs, nor radiated disposition of internal organs.	
V. Insecta.	Oviparous; undergo metamorphosis; possess, in their perfect state, eyes in their head; six articulated limbs; tracheæ extending over the whole body; a single fecundation in the course of life.	3d. Nerves ending in a longitudinal, knotted, medullary cord; respiration by tracheæ, which convey air; circulation imperfect, or none.
VI. Arachnida.	Oviparous; undergo no metamorphosis, but possess always articulated limbs, and eyes in their head. Tracheæ confined to certain parts; an attempt at circulation; several fecundations in the course of life.	
VII. Crustacea.	Oviparous; body and limbs articulated; skin crustaceous; eyes on the head; and generally four antennæ; respire by branchiæ; a longitudinal knotted medullary cord.	4th. Nerves ending in a brain, or a knotted medullary cord; respiration by branchiæ; arteries and veins for circulation.
VIII. Annelida.	Oviparous; body elongated and annulated; no articulated limbs; seldom eyes; respire by branchiæ; knotted nervous cord.	
IX. Cirrhipeda.	Oviparous; possess a mantle and articulated arms, with horny skin; no eyes; respire by branchiæ; knotted nervous cord.	
X. Mollusca.	Oviparous; body soft, with its parts not articulated; mantle variable; respire by branchiæ, varying in form and situation; no spinal marrow, nor knotted longitudinal cord, but nerves ending in a brain.	

Structure and Formation of the hard Parts, which supply the Place of the Skeleton in the lower Orders.—The want of an internal articulated skeleton is the most striking character of the second great division of the animal kingdom, or the invertebral animals. Insects and crustacea have a species of external skeleton; they possess hard parts, which are at once instruments of motion, and means of support and protection for the included softer organs. (See Insects, in *Anatomy*.) The shells of the mollusca are to be regarded rather as provisions for defence, as habitations of the soft animals which they inclose, than, like the skeleton of the vertebral animals, or the hard external covering of crustacea and insects, as instruments of motion.

Shells are composed, like bones, of a calcareous matter, intimately connected with a gelatinous substance, from which it may be separated by means of acids. It is not disposed in laminæ, or in fibres, but is distributed uniformly throughout the whole body of the shell.

It is only in some species that we find strata easily separated, and as it were agglutinated to each other, like the leaves of paper in the formation of pasteboard. We know from observation that these strata do not all exist in young animals; they have only the external, which are at the same time the smallest. In proportion as the animal increases in age, it forms a new stratum on the internal surface of the shell, which extends beyond the edges of all the preceding strata; so that each operation of this kind adds to the size of the shell in length, breadth, and thickness. These are certain facts: to prove them, it is only necessary to compare some shells of the same species that have belonged to individuals of different ages; the fewest strata will always be found in the shells of the young. Muscles, which may be observed when they are very young, and even before they quit the body of the mother, have at that period one stratum only; but the shell is not therefore soft and gelatinous; it possesses the same firmness as the adult shell, and its greater fragility is merely owing to its thinness.

It has been a question among physiologists, whether these shells grow by developement or intussusception, or by simple juxtaposition? That is, whether the shell, like our bones, contains nutritive vessels capable of increasing, diminishing or variously modifying it; or whether the gelatinous and calcareous component elements of the shell are simply deposited from the surface of the animal's body, and attached to the pre-existing mass? We conceive that the latter mode of formation has been incontrovertibly established; that the substance of the shell is inorganic, and consequently possesses no power in itself of increase, diminution, or any vital change.

This point was first investigated by Reaumur, whose researches are so clear and satisfactory, that they have left very little to be added by his successors. They are detailed in the Memoires de l'Academie des Sciences for 1709, under the title " De la Formation et de l'Accroissement des Coquilles

quilles des Animaux tant terrestres qu'aquatiques, soit de Mer, soit de Terre." He followed up the subject, in answer to some objections, in the Memoirs for 1716, p. 303: under the title "Eclaircissemens de quelques Difficultés sur la Formation et l'Accroissement des Coquilles."

"When (says the author) the animal, which filled its shell exactly, increases in size, and the shell is consequently insufficient to cover it entirely, a part of the surface must be exposed. This is the part nearest to the opening, for the animal's body can be augmented only in that direction. The inhabitants of a spiral shell, as snails, grow only in the direction of the head, or towards the opening of the shell; while those which occupy bivalve shells, as muscles, can increase in their whole circumference. In both cases it is the uncovered portion of the body that produces the shell." Mém. de 1709, p. 367.

"That the animal really grows before its shell, in the way just pointed out, may be easily seen in the garden-snails at their season of increase. We observe that the shell is too small. The animal fixes itself against a wall, or remains at rest, and a part of its body manifestly extends beyond the shell all round." Ibid. p. 370.

He illustrates the natural growth by the process employed for repairing injuries. "After breaking away a portion of the shell, which can be easily done without injuring the animal, as it adheres only at one point, we observe the creature soon attach itself to the sides of the vessel in which it is placed. A fine pellicle, which may be compared to the web made by the house spider in the angles of walls, covers the body in twenty-four hours, and forms the first stratum of the new shell. In a few days this is thickened by several strata produced under it; and, at the end of about ten or twelve days, the new portion of shell has nearly the thickness of the original part." P. 371.

"If," he observes, "the injury were repaired by means of materials furnished by the broken edge, as in the case of a fractured bone, we should observe a callus produced from that margin, and extending gradually into the centre of the aperture. But the edge, in fact, remains unaltered, and the matter deposited is on the surface of the body." P. 373.

That the body of the animal affords the materials by which the shell is formed, is rendered more evident by the following experiments. "I broke away a portion of the shell, and placed in the opening, between the animal's body and the shell, a portion of lamb-skin leather, such as is used to make what are called chicken gloves. I fastened this to the internal surface of the shell, so that it completely shut up the opening intervening between the shell and the animal's body. It is evident, that if the shell itself produced the materials of restoration, the new substance ought to be formed, in such circumstances, on the exterior surface of the leather. On the contrary, however, that side which was towards the animal's body became lined with shell, and none was deposited on the exterior surface.

"Again, I broke away a part of the shell at its opening, introduced a portion of the leather, and fastened it to the inner surface; then turned it down, and fastened it also to the outer surface, so that the circumference of the opening, with its broken edge, was completely covered. Now, if the shell grows by a principle of vegetation, either this covering should have prevented the growth, or the elongation of the shell should have pushed the leather forwards. On the contrary, the shell grew, and the leather remained where it was placed, being interposed between the old shell and the new piece, to the formation of which the former consequently could not have contributed." P. 374.

"It is a necessary consequence of the preceding facts, that the shells of snails increase in size, only by an addition to the number of their spiral turns, and that the length of a turn, when once formed, continues always the same. The truth of this statement is easily shewn. If the shell of a full-grown snail be reduced to the same number of turns as that of a young one of the same species, the two shells are then of the same size. This holds true, even with respect to the shells of snails just produced. A turn more or less makes a great difference in the size of the shell; for the diameter of each is nearly double that of the preceding, and about one-half of the following: hence half, or even a fourth of a turn more increases considerably the size of the shell." P. 378.

The same point has been attentively examined by Mr. Carlisle, whose conclusions confirm in all respects those of Reaumur.

"The most apposite illustrations, and the most positive instances of union between vital and extra-vital parts, are to be found in the testaceous tribe of animals. After a long-continued and careful investigation, I am fully convinced, that the shells of all the vermes of Linnæus are extra-vascular from their commencement, and remain so during the whole of their connection with the living creature. The first production and the growth of those shells always depend upon a deposit of material thrown out from the surface of the body of the living animal. The figure and colours of the several parts of those shells, in every species, depend upon the shape and the colouring glands of the modelling organs. Fractures are repaired by spreading a crustaceous fluid over the inner edges, and never by any exudation from the fractured parts, since they retain always the squared broken surfaces after such repairs. Extraneous bodies are equally covered with shell, whether they are in contact with the parent shell or not. The first may be seen in the frequent envelopement of nereises in the common oyster; the latter has been often ascertained by the experiments made for the purpose of creating artificial pearls, and which might, if skilfully practised, yet prove very successful. The borings of parasitical vermes into shells are never filled up, or the bored surface altered, unless such borings penetrate into the cavity where the living animal dwells, and then the apertures are invariably plugged up or smeared over with pearly matter. The water-worn external surfaces of old shells, and other external abrasions, are never repaired, which is to be seen in old living oysters exposed to the moving friction of currents or strong tides, in the worn-off spines of the pholas dactylus, and in the convex points of the two valves of old mytili, especially the mytilus anatinus. I have sought in the most extensive collections of the metropolis for examples of fractures and other injuries which have occurred to the shells of living vermes, and I have collected many remarkable specimens. They all demonstrate the same results without any exception. I have made numerous experiments upon the garden-snail, (helix nemoralis,) by fracturing and breaking away the shell in various parts, and have always found the repairs to be effected from within by first smearing over an epidermoid varnish, and then by plaistering the inner surface of that film with successive calcareous laminæ. I have in vain attempted to inject the shells of recent vermes from the vascular parts of their bodies; and am fully satisfied, that none of their albuminous or gelatinous testaceous membranes were ever at any time traversed by vessels; indeed, they do not possess any of the reticular texture or arborescent pores which are common to all vascular parts; but, microscopically examined, they resemble the exuvial or epidermoid membranes. To these may be added the notorious circumstance of the unchange-

ableneſs of the outer ſurfaces of teſtaceous ſhells during their growth, and the continued renewal of their other ſurfaces which admit of contact with the living inhabitant; next, the ſtains and coloured tranſudations which they often derive from metallic ſalts, and other colouring materials placed in their vicinity; and laſtly, that ſuch occurrences do not affect the living animal." See "Facts and Obſervations relative to the Connection between vaſcular and extra-vaſcular Parts, in the Structure of living organized Bodies." Lond. Med. Repoſitory for Auguſt, 1814.

It is ſtated of ſome teſtaceous molluſca, that they quit their ſhell to form a new and larger one. Cuvier aſſerts this of the cypræas, and it is alſo ſuppoſed to be the caſe with the balani. (See Annales du Muſéum, t. i. p. 470.) In theſe inſtances it is clear that the ſurface of the body muſt form the new ſhell.

The inhabitant of the paper nautilus (argonauta argo) does not adhere to its ſhell at any point; the additions to the ſhell cannot therefore poſſibly be made by the way of developement. It grows, in all probability, by a ſecretion formed by its two palmated arms. Nautili are met with where extenſive fractures have taken place, and have been conſolidated by depoſition from within. Hiſt. des Molluſques, par Denys Montfort, t. iii. p. 284.

The animal comes out of its egg with the ſhell ready formed; it poſſeſſes one turn, and ſometimes rather more, but is very thin. Leeuwenhoeck firſt aſcertained the fact reſpecting oyſters. Liſter made the ſame obſervation, and extended it to other teſtacea, both terreſtrial and aquatic. Marſigli, Rumphius, Swammerdam, Reaumur, and Adanſon, confirmed the diſcovery. The latter naturaliſt ſhewed that the viviparous teſtacea agree with the oviparous, in the circumſtance of their young being covered by ſhells at the time of birth, and even before. Encycl. Method. t. vi. p. 549.

"As the animal grows after birth, its body advances conſtantly towards the mouth of the ſhell; the poſterior end quits the bottom of the firſt turn, to which it does not adhere, and when the ſize of the ſhell is complete, it occupies a ſituation very diſtant from its original one. In ſome ſpecies of an elongated figure, as the bulime conſolidé and decollé, and ſeveral others, where the end of the ſpire remains very thin and unſupported, it is liable to break: the animal ſtops the breach by a new calcareous exudation from the poſterior end of its body. In other teſtaceous molluſca the end of the ſpire becomes ſolid, and preſents a maſs of laminated calcareous matter, ſometimes as hard as marble. The ſucceſſive layers are diſtinctly viſible when a ſection is made. I have now before me a ſplendid ſpecimen of the trochus Niloticus, in which ſix turns of the ſpire are ſolid, and filled with a calcareous ſubſtance equal to the fineſt Carrara marble. I can demonſtrate the ſame fact in other ſhells.

"In ſome caſes different phenomena are exhibited. The murex tritonis not only has the apex of its long ſpire conſolidated, but, as the animal grows older, and abandons more rapidly the extremity of the ſpire, inſtead of filling up the whole tube, it forms only thick ſepta, which are conſtructed ſucceſſively in the ſituations where the animal's body reſts for a while." Hiſt. des Molluſques, par Denys Montfort, t. iii. p. 246, et ſeq.

Some white-blooded animals have hard parts internally; but they are not articulated ſo as to form the baſes of moveable members, and their texture differs conſiderably from that of ordinary bones. The common cuttle-fiſh (ſepia officinalis) contains in the fleſh of the back an oval ſubſtance, convex before and behind, white, ſolid, friable, and of a calcareous nature. This ſubſtance is not attached to the fleſh, but has the appearance of a foreign body introduced into it. There is no indication of any veſſel or nerve entering it; nor is any tendon affixed to it. It is compoſed of thin parallel lamellæ, which are not in immediate contact with each other. The intervals are occupied by an infinite number of ſmall hollow columns, ſtanding perpendicularly between one lamella and another, and arranged in very regular quincunces. As the ſuperficies of the lamellæ are plane, and thoſe of the bone itſelf convex, they neceſſarily interſect each other: the points of interſection are marked on the ſurfaces of the bone by regular curvilinear ſtriæ. Theſe bones have a kind of wings, which are of a leſs opaque nature, leſs brittle, and have a greater reſemblance to thin elaſtic horn, than the body of the bone.

To this laſt ſubſtance the part called the ſword of the calmar (ſepia loligo) bears an analogy. It is tranſparent, elaſtic, and very brittle; its ſhape is ſometimes that of a leaf, ſometimes of a ſword-blade. It bears the ſame relation to the ſoft parts, and occupies the ſame ſituation as the bone of the cuttle-fiſh.

There is a gradation in ſtructure from this ſword of the calmar and bone of the cuttle-fiſh, which are completely internal, to the external ſhells of the teſtacea. The bulla aperta (Linn.), bullæa (Lamarck), has a ſhell contained in its cloak or outer integument, and not viſible on the exterior of the body. It is extremely thin, and almoſt tranſparent; not attached to the body by any muſcle, for it is ſo weak that the ſlighteſt muſcular force would break it. It is ſtriated, ſo as to indicate ſucceſſive depoſitions; and ſo placed in the body as to cover the principal viſcera. (Cuvier, Annales du Muſéum, t. i. p. 159. pl. 12.) The dolabella, teſtacella, and parmacella, have analogous ſhells, called by Cuvier coquilles cachées. (Ibid. t. v.) There is a thin ſhell contained in the cloak of the pleuro-branchus. (Ibid. t. v. p. 270; pl. 18. B. fig. 3.) There is a ſmall and thin calcareous plate in the back of the ſlug, analogous to the common ſhells. The fleſhy covering of the branchiæ has a larger but thin, horny, tranſparent and flexible plate in the aplyſia. Ibid. t. ii. p. 297.

The inſulated bony or horny pieces juſt enumerated, particularly that of the cuttle-fiſh, ſtrongly confirm the repreſentation which has been already given reſpecting the growth of ſhells. They muſt increaſe by ſtrata ſucceſſively depoſited; and they may thus be called internal ſhells.

The aſterias and echinus have a kind of ſkeleton, the nature of which very much reſembles that of the molluſca. In the echinus it is a ſolid calcareous envelope, frequently very hard. It has a number of little holes, through which paſs membranous feet, furniſhed with tubercles and points analogous to the ſubſtance of the ſhell, which play freely on theſe tubercles.

In the ſtar-fiſh, the calcareous part forms a ſtalk, compoſed of a number of ſmall articulated vertebræ, which extend under the middle of each of the branches of the body, and to which is attached a kind of oſſeous grating, which ſupports the remainder of the envelope of the branch to which it belongs, and which is rendered remarkable, even externally, by its projection, and by the tubercles of different forms that cover the whole of its ſurface.

Their oſſeous ſtalk cannot be regarded as completely external, ſince it is covered outwardly by an epidermis and other ſoft parts. This is, perhaps, the moſt ſtriking exception to the general rule that white-blooded animals have no internal articulated ſkeleton. The mode of growth of the ſkeleton of the ſtar-fiſh has not yet been ſufficiently inveſtigated: the ſkeleton of ſome holothuriæ is exactly ſimilar.

Corals, other zoophytes, and lithophytes, have hard parts, which are fometimes horny, fometimes calcareous, and fometimes fpongy; but which grow by fimple juxtapofition, or at leaft like fhells by the addition of fucceffive ftrata. In fome their growth takes place externally, and the fenfible fubftance envelopes the old ftrata by new ones, with which it again covers itfelf. Such is the cafe with the lithophyta and ceratophyta. In others, the parts which have once attained their proper hardnefs, no longer increafe in thicknefs; but new fhoots or branches are formed at their extremities. Such are all the jointed zoophytes.

There are fome minute obfervations on the texture, courfe of the fibres, &c. of fhells, and fimilar fubftances, in a paper by Mr. Beudant, entitled "Memoire fur la Structure des Parties folides des Mollufques, Radiaires, et Zoophytes." See Annales du Muféum, t. xvi. p. 66.

Chemical Compofition of Shells, &c.—For our knowledge of the chemical compofition of thefe fubftances, we are indebted principally to the excellent papers of Mr. Hatchett in the Philofophical Tranfactions for 1799 and 1800.

Shells, like bones, confift of calcareous falts united to a foft animal matter; but in the former the lime is united chiefly to carbonic acid, whereas in the latter it is united to phofphoric acid. The predominating ingredient in fhells is carbonate, in bones, phofphate of lime. This conftitutes the characteriftic difference in their compofition.

Mr. Hatchett divides fhells into two claffes. The firft are ufually of a compact texture, refemble porcelain, and have an enamelled furface often finely variegated. The fhells belonging to this clafs have been diftinguifhed by the name of porcellaneous fhells; they are exemplified in the voluta, cypræa, &c. Thofe of the fecond clafs are ufually covered with a ftrong epidermis, below which lies the fhell in layers, and compofed of the fubftance known by the name of mother-of-pearl: thefe he calls mother-of-pearl fhells. The frefh-water mufcle, the halyotis iris, and the turbo olearius, are examples. In the firft clafs there is a fmall, in the fecond a large proportion of animal matter.

Porcellaneous fhells contain fo little animal matter, that they emit no fmoke nor fmell, when expofed to a red heat, nor are they blackened; and they diffolve with effervefcence in acids, without leaving any refidue. They confift, therefore, of carbonate of lime, cemented together by a fmall portion of animal matter, which is foluble in acids, and therefore refembles gelatine.

Some patellæ from Madeira, examined by Mr. Hatchett, confifted alfo of carbonate of lime, but they emitted a fmell like horn, when expofed to a red heat, and left a femiliquid gelatinous matter behind, when diffolved in acids. They contain, therefore, lefs carbonate of lime, and more animal matter, which is alfo of a more vifcid nature than that of porcellaneous fhells.

The mother-of-pearl fhells, when expofed to a red heat, crackle, blacken, and emit a ftrong fetid odour. When immerfed in acids, they effervefce at firft ftrongly; but gradually more and more feebly, till at laft the emiffion of air-bubbles is fcarcely perceptible. The acids take up only lime, and leave a number of thin membranous fubftances, which ftill retain the form of the fhell. From Mr. Hatchett's experiments, we learn that thefe membranes have the properties of coagulated albumen. Thefe fhells, then, are compofed of alternate layers of coagulated albumen and carbonate of lime, beginning with the epidermis, and ending with the laft formed membrane. The animals which inhabit thefe fhells, increafe their habitation by the addition of a ftratum of carbonate of lime, fecured by a new membrane.

Different fhells vary confiderably in the proportion of their conftituents, and in the confiftency of the albuminous part. Some, as the common oyfter-fhell, approach nearly to the patellæ, the albuminous portion being fmall, and its confiftence nearly gelatinous; while in others, as the halyotis iris, the turbo olearius, the real mother-of-pearl, and a fpecies of frefh-water mufcle, the membranes are diftinct, thin, compact, and femi-tranfparent. One hundred parts of mother-of-pearl contain fixty-fix of carbonate of lime, and thirty-four of membrane. Merat-Guillot in Ann. de Chimie, tom. xxxiv. p. 71.

Pearls, or the concretions formed in thefe fhells, refemble them exactly in ftructure and compofition. The fubftance confifts of concentric and alternate coats of thin membrane and carbonate of lime. Hatchett, in Phil. Tranf. 1799.

The bone of the cuttle-fifh was found by Mr. Hatchett to be exactly fimilar, in its compofition, to mother-of-pearl fhells.

Mr. Hatchett compares the porcellaneous fhells to enamel of teeth, (fee Cranium,) and mother-of-pearl fhells to the bone of teeth, or other bone. (See Bone.) The only difference is, that in enamel and bone the earthy falt is phofphate of lime, whereas in fhells it is pure carbonate of lime.

The fhells of the echini, and the crufts of the afterias (ftar-fifh), are made of carbonate, with a fmall quantity of phofphate of lime; and a greater or lefs proportion, according to their hardnefs or flexibility, of an animal, gelatinous, or albuminous matter.

Many of the fubftances which compofe the bafis, or hard part of zoophytes, have the hardnefs and appearance of fhell or bone: others are foft, and belong rather to the clafs of membrane or horn. From Mr. Hatchett's admirable differtation in the Philofophical Tranfactions for 1800, and the experiments of Merat-Guillot in the Annales de Chimie, tom. xxxiv., our knowledge of the chemical conftitution of thefe fubftances is derived.

The hard zoophytes are compofed chiefly of three ingredients; 1. An animal fubftance of the nature of coagulated albumen, varying in confiftency, fometimes being gelatinous, and almoft liquid, at others of the confiftency of cartilage; 2. Carbonate of lime; 3. Phofphate of lime.

In fome zoophytes the animal matter is very fcanty, and phofphate of lime wanting altogether; in others, the animal matter is abundant, and the earthy falt pure carbonate of lime: in fome, there is much animal matter, with a mixture of carbonate and phofphate of lime; and a fourth clafs is almoft entirely deftitute of earthy falts. Thus we have four claffes; of which the firft refembles porcellaneous fhells, the fecond mother-of-pearl fhells, the third the crufts of the cruftacea and echino-dermata, and the fourth horn.

1. When the madrepora virginea is immerfed in diluted nitric acid, it effervefces ftrongly, and is foon diffolved. A few gelatinous particles float in the folution, which is otherwife colourlefs and tranfparent. Ammonia precipitates nothing, but its carbonate throws down abundance of carbonate of lime. It is compofed, therefore, of carbonate of lime and a little animal matter. The following zoophytes yield nearly the fame refults; *viz.* madrepora muricata and labyrinthica; millepora cærulea and alcicornis; and tubipora mufica.

2. The madrepora ramea effervefces in weak nitric acid; but when all the foluble part is taken up, there remains a membrane, completely retaining the original fhape of the madrepore. The fubftance taken up is pure lime. Hence it is compofed of carbonate of lime, and a membranaceous fubftance, which, as in mother-of-pearl fhells, retains the figure of the madrepore.

 The

The following zoophytes yield nearly the ſame reſults; *viz.* madrepora faſcicularis; millepora cellulofa, faſcialis, and truncata; and iſis hippuris.

Merat-Guillot gives the following ſtatement of the compoſition of three ſpecies, which muſt, according to this account, be referred to the preſent claſs.

	White Coral.	Red Coral.	Articulated Coralline.
Carbonate of lime	50	53.5	49
Animal matter	50	46.5	51
	100	100.0	100

3. Immerſion in weak nitric acid does not affect the ſhape of the madrepora polymorpha: there remains a tough, opaque, membranaceous ſubſtance of a white colour, filled with a tranſparent jelly. The acid ſolution yields a ſlight precipitate of phoſphate of lime, when heated with ammonia, and carbonate of ammonia throws down a copious precipitate of carbonate of lime. It conſiſts, therefore, of animal matter, partly in the ſtate of jelly, partly in that of membrane, hardened by carbonate, together with a little phoſphate of lime.

The fluſtra foliacea, corallina opuntia, and iſis ochracea, gave the ſame reſults; except that in the two latter, phoſphate of lime could only be diſcovered in the ſolution of the burnt ſubſtance.

The colouring matter of the iſis ochracea falls down in a fine red powder in weak nitric or muriatic acid: whereas that of the tubipora muſica, and of the gorgonia nobilis, or red coral, is deſtroyed by theſe acids.

After the red coral has been immerſed in acid, it is ſeen to conſiſt of two parts, *viz.* an external tubulated membrane of a yellow colour, incloſing a tranſparent gelatinous ſubſtance. The acid ſolution yields only carbonate of lime; but when the red coral is heated to redneſs, and then diſſolved, the ſolution yields a little phoſphate of lime alſo. Red coral then conſiſts of an internal ſtem, compoſed of gelatinous matter and carbonate of lime; and an external covering or cortex, conſiſting of membrane hardened by the calcareous ſalts; and both coloured by ſome unknown ſubſtance.

The gorgonia ceratophyta and flabellum have a ſimilar compoſition. The cortex of the gorgonia ſuberoſa contained a little phoſphate and a large portion of carbonate of lime. The ſtem contained ſcarcely any earthy ſalt. The gorgonia ſetoſa and pectinata exhibited nearly the ſame phenomena.

4. Gorgonia antipathes has a horny ſtem, but is deſtitute of cortex. It gives out ſome gelatine to boiling water. When ſteeped in nitric acid, it becomes ſoft, and exhibits concentric coats of thin, opaque, brown membranes, of a ligneous aſpect. With potaſh it forms an animal ſoap, and poſſeſſes nearly the properties of horn. The ſtems of the gorgonia umbraculum and verrucoſa are ſimilar; but they both poſſeſs a cortex, compoſed of membrane and carbonate of lime.

Mr. Hatchett analyſed many ſpecies of ſponges; but found them all ſimilar in their compoſition. They conſiſt of gelatine, which they gradually give out to water, and a thin brittle membranous ſubſtance, which poſſeſſes the properties of coagulable albumen.

The alcyoniums reſemble very much in their compoſition that of the gorgonia ſuberoſa. They yield a little gelatine to water. They are ſoftened, and appear membranous in nitric acid, which takes up the carbonate of lime, and likewiſe a little phoſphate, at leaſt when the ſubſtance has been previouſly heated to redneſs.

In the Annales du Muſéum d'Hiſtoire Naturelle, we have an account, by A. Laugier, of the earthy and ſaline matters contained in the liquor produced by the ſpontaneous decompoſition of the meduſæ. This was procured by the melting of a blue meduſa taken in the Channel. When left to ſpontaneous evaporation, a cryſtalline pellicle formed, and was removed, and ſo on ſucceſſively, until no more cryſtals were formed. "The ſalt thus obtained," ſays the author, "was formed of carbonate and phoſphate of lime; theſe ſalts exiſting in exactly the ſame proportions as in all the calcareous concretions, produced by the hardening juices of the molluſca, the polypes, and the cruſtacea, which I have examined, ſuch as red coral, white coralline, oyſter-ſhells, crab's-eyes, &c. *viz.* carbonate of lime 92, phoſphate of lime 7, animal matter uniting the molecules 1, in 100 parts. See p. 346.

The remaining liquor, being evaporated to dryneſs, gave a ſaline reſidue, of which the component parts, ſimilar to the ſalts of the ſea, were, in 100, muriate of ſoda 79, muriate of lime 4, muriate of magneſia 3, muriate of iron 2, ſulphate of lime 1, water and loſs 11. P. 349.

So complete, ſays Péron, is the ſpontaneous fuſion of the meduſæ, that from an individual weighing ſeveral kilogrammes, hardly a few milligrammes of membranous reſidue remain in the filter. Ann. du Muſ. t. xv. p. 43.

Organs of Motion.—In the cephalopodous molluſca.

The molluſca, which have the head furniſhed with long appendages for progreſſive motion, are called cephalopoda; and have two orders of muſcles, one belonging to the body, the other to the feet or tentacula.

The ſac which compoſes the body of theſe animals, ſtripped of the external ſkin, preſents a muſcular tiſſue of very compact fibres. Thoſe of the outer layer appear to have a longitudinal direction; the middle layer is tranſverſe; and the ſucceeding layers have different obliquities. They can flatten, elongate, twiſt, and bend the ſac; but the action of each layer cannot be aſſigned in a poſitive manner, on account of their very complicated ſtructure.

In the back of theſe animals, under the ſkin, there is found a body more or leſs ſolid. In the cuttle-fiſh it is a ſpecies of bone compoſed of different thin parallel plates one above another, and ſeparated by little columns diſpoſed in the form of quincunces. This bone is oval, thick towards the middle, and thin at the circumference. In other ſpecies, its form varies much, but its ſubſtance is generally elaſtic, and tranſparent like glaſs. Its ſurface is ſometimes marked with longitudinal furrows.

The ſepia octopus wants it entirely.

Two ſtrong muſcles ariſe from the inner ſurface of the ſac, on each ſide of this bone. They run towards the head, and on their arrival there, divide each into two branches; one branch is inſerted into the head, the other mixes its fibres with thoſe of the ſac, at the edge of which it ends. The cephalopoda have eight conical feet, of different lengths, arranged in a circle at the top of the head, round the mouth. The animal can turn and bend them in every direction, and faſten itſelf to bodies by help of the cups or ſuckers with which they are furniſhed. The muſcles, which perform their motions, are very numerous: they may, however, be diſtinguiſhed into thoſe that are common to the whole foot, and thoſe that are proper to the ſuckers.

Below the ſkin we find a very thin muſcle, the fibres of which are united by a looſe cellular ſubſtance. It accompanies the ſkin in all its different ſhapes, and may, perhaps, be regarded as a muſculus cutaneus employed to corrugate the ſkin, and give greater force to the muſcle ſituated within it, upon which it acts like a girdle. Between the feet, and under the ſkin, which unites them at their baſe, two

two thin muſcles are ſituated, one below the other, the fibres of which are tranſverſe. One ariſes in the middle longitudinal line of the foot, on the ſide oppoſite to the ſuckers, and proceeds directly to its inſertion in the ſame line of the adjacent foot on either ſide. The other ariſes below the ſuckers themſelves, goes over the lateral parts of the foot, and at laſt forms a muſcular membrane with tranſverſe fibres, which paſſes under the preceding muſcle, and proceeds to its inſertion in the other foot, exactly in the ſame manner as it took its origin. This double muſcular membrane bears ſome analogy to that which unites the toes of web-footed birds, ſuch as ducks, geeſe, &c. It produces a circular plate, which occupies the intervals between each baſe of the feet. Theſe two muſcles probably ſerve to bring the feet nearer to each other; the ſecond may beſides ſeparate the two rows of ſuckers. It reaches the whole length of the foot, but becomes thinner towards the extremity.

Below theſe three layers of muſcles (the two tranſverſe and the cutaneous), we find another pretty large one, the conical figure of which determines the ſhape of the foot. At the ſurface it ſeems entirely formed of tranſverſe fibres; but on cutting it in different directions we find that it has longitudinal fibres. Theſe fibres are interwoven like thoſe of the human lingual muſcle towards its centre. In the centre of this muſcle there is a vacant ſpace, in which we find very large veſſels and nerves. The ſuckers are faſtened to the inferior ſurface of this muſcle, and to a layer of fibres ſtill more evidently longitudinal, by little fleſhy bands, differing in direction according to the ſpecies.

The ſuckers are formed by a muſcular cup of radiated fibres, which, by their contraction, diminiſh its capacity. But at its edge, and cloſe to the plate under the cylindrical muſcle, there is another layer of circular fibres, like a ſphincter, which renders the cup more convex. Finally, each ſucker is retained and moved upon the foot by little muſcular faſciculi interlaced together, and uniting at laſt in the inferior tranſverſe muſcle of the foot. At leaſt, this is the caſe in the ſepia octopus.

In the calmar (ſepia loligo), and the cuttle-fiſh (ſepia officinalis), the ſuckers are attached by very ſmall muſcular peduncles.

When an animal of this kind approaches any body with its ſuckers, in order to apply them more intimately, it preſents them in a flat or plane ſtate; and when the ſuckers are thus fixed, by the adaptation of ſurfaces, the animal contracts the ſphincter, and forms a cavity in the centre, which becomes a vacuum. By this contrivance, the ſucker adheres to the ſurface with a force proportioned to its area, and the weight of the column of air and water of which it forms the baſe. This force, multiplied by the number of ſuckers, gives that by which all or a part of the feet adhere to any body. The power of adheſion is ſuch, that it is eaſier to tear off the feet than to ſeparate them from the ſubſtance to which the animal chooſes to attach itſelf.

In the cuttle-fiſh and the calmar, the mouth of the ſucker is ſurrounded by a cartilaginous indented zone; in the octopus it is only a fleſhy diſk, flat, and perforated in the middle.

Beſides the eight feet juſt deſcribed, which are all that are poſſeſſed by the octopus, the cuttle-fiſh and calmar have two others much longer and ſmaller, and without ſuckers, except at the extremity, which is enlarged. Their ſtructure is in other reſpects the ſame as that of the other feet.

The organs of locomotion in the gaſteropodous molluſca, reſide principally in that inferior part of the body on which they drag themſelves forwards, and which is called their foot. It is a fleſhy maſs, formed of fibres which croſs each other in ſeveral directions, and are capable of giving it every poſſible ſhape. Moſt commonly it has that of an oval, pointed behind; but, by the various contractions of which theſe fibres are ſuſceptible, they extend or contract it in the whole or in part, ſo as to produce that ſlow progreſſive motion, which every body has remarked in the common ſnail or ſlug. The tranſverſe fibres are eaſily ſeen in the foot of the ſlug, if it be opened by the back. They proceed from the edges of the foot to two longitudinal middle tendinous lines. Below theſe we meet with others in a contrary direction; but ſo interwoven, that it is difficult to trace the layers.

In the ſcyllæa the foot is only a longitudinal furrow, impreſſed in the whole length of the belly of the animal. By the help of this furrow it embraces the ſtalks of fucus, upon which it crawls. In other reſpects, the organization of its foot is nearly the ſame as that of the ſlug.

In the limpet (patella), the inferior layer is compoſed of tranſverſe fibres, which are interlaced at the edge with numerous circular ones. The ſuperior layer conſiſts of two rows of fibres, meeting at an acute angle on a middle line, which correſponds to the long diameter of the foot. There are alſo ſome circular fibres at its edge. The inferior layer, by its contractions, lengthens the ellipſis of the foot, while it leſſens the breadth; and the inferior diminiſhes the length, but increaſes the breadth. This is the mechaniſm which produces the progreſſion of theſe animals. Laſtly, the circular fibres diminiſh the ſurface on all ſides, and render it convex above, thereby producing a vacuum, which makes the animal adhere firmly to the ſurface that ſupports it. So powerful is this adheſion, that we cannot ſeparate a limpet from the rock by means of the fingers.

Reaumur tied a ſtring round the limpet, called by the French œil du bouc (patella Græca), and ſuſpended a weight from it perpendicularly. Thirty pounds were neceſſary to ſeparate the ſhell; and this weight was ſupported by the animal for a ſhort time. Reaumur conceives that the adheſion is not produced on the principle of forming a vacuum, but by a viſcous fluid; and ſtates, that when the ſhell and animal were ſplit vertically, the divided portions ſtill adhered. (Mem. de l'Acad. des Sciences de Paris, 1711, p. 109, et ſeq.) In this repreſentation we are ſatisfied that this able obſerver was miſtaken.

The gaſteropodous molluſca, which are furniſhed with ſhells, poſſeſs, beſides the muſcles juſt deſcribed, others that enable them to retreat into the ſhell, and protrude their body from it again. Theſe ſhells, or moveable habitations, vary much in their form. They are generally made of one piece, of different ſhapes, ſimple, without twiſting, in the limpet; in a flattened ſpire, as in the planorbis; in a globular and pyramidal ſpire, as in the ſhell of the ſnail, bulimus, dipper-ſnail, &c. The chiton is the only genus of gaſteropoda which has a ſhell formed of ſeveral pieces.

In the limpet the foot is faſtened to the circumference of the ſhell by a ring of fibres attached all round the ſhell, and which, after piercing the outward covering or cloak, are inſerted in the edges of the foot, and interlaced with its circular fibres. They leave a ſpace in front, for the paſſage of the head. This muſcle, by its contractions, brings the foot and the ſhell cloſer together, and compreſſes the body; on relaxing, it allows the ſhell to be raiſed up by the elaſticity of the body.

In the garden-ſnail there are two ſtrong muſcles, which draw

draw the foot and the whole body within the ſhell. They ariſe from the columella or axis of the ſhell, and, having penetrated the body below its ſpiral part, they run forward under the ſtomach, and ſpread their fibres in ſeveral ſlips, which interlace with thoſe of the muſcles proper to the foot, the ſubſtance of which they enter. From theſe attachments, their mode of action may be eaſily underſtood. When the animal wiſhes to protrude itſelf from the ſhell, its head and foot are forced out by circular fibres, which ſurround the body immediately above the foot.

The acephalous molluſca have the body enveloped by a membrane principally muſcular, which is called the mantle or cloak. This integument is more or leſs complete in the different genera. It is generally covered by valves or ſhells of various forms and proportions. Few of the genera want this ſolid covering; among thoſe, however, are the aſcidia and ſalpa.

The valves of the ſhells are ſo diſpoſed, that they can move one upon the other, by means of oſſeous projections, which reciprocally receive each other, thus forming a real hinge. They are, beſides, connected by an elaſtic ligament of a horny ſubſtance, which continually tends to open them. "This elaſtic ſubſtance," ſays Mr. Carliſle, "is wedged in at the hinge: its ſpring is excited by compreſſion; but it does not poſſeſs the property of expanſion beyond its paſſive ſtate. When dried, it cracks into cubes. As the valves increaſe, this elaſtic ligament is augmented along the inner ſurface only, and muſt have been always depoſited during the expanded ſtate of the valves, ſince the limits of its elaſtic condition are exactly adapted to that ſtate. As the laminæ of the ſhells increaſe, there is a gap at the outſide of the hinge, filled with ſoft crumbling and decompoſing worn-out elaſtic ligament: this gap preſents two inclined planes meeting at an acute angle, and that ſpace is kept free from pebbles and hard extraneous bodies by the preſence of the decompoſing ligament; as ſuch an accident would prove fatal, by preventing the opening of the valves." Monthly Repoſitory for Auguſt, 1815.

The hinge of the ſhells preſents ſo many varieties, that naturaliſts have drawn from it the characteriſtics of the genera. The oyſter, placuna, ſcallop, avicula, &c. have no tooth in their joint. The piddocks and the mya or gapers have it in one of the valves only; but it is not received into a foſſa. The razor-ſhells have the hinge ſtrengthened by a tooth in each ſhell, which projects inward. Theſe two projections meet and move upon each other. The anomia, unio, chama, ſpondylus or thorny oyſter, and ſeveral others, have one or two teeth on one valve only, which are received into correſponding cavities, in the oppoſite valve. The venus, cockle, and mactra, have teeth on each ſhell, which are mutually received. Laſtly, the arca has a multitude of little teeth, which are cloſely indented with each other. Theſe different conformations either facilitate the motion of the hinges, or ſtrengthen the joint; or they permit a greater or leſs opening of the valves.

The elaſtic ligament, which tends continually to open the valves, is not always ſituated at the ſame point of the ſhell. The muſcles, for example, have it at one ſide of the valves. The placunæ have a little oſſeous appendage, which forms a projection in the inſide of each valve; and from this ariſes the ligament that holds them together. The perna has in each valve ſeveral little cavities, oppoſite to each other in pairs, in which an equal number of ſmall ligaments are lodged.

The ſhells of the acephala preſent ſeveral other peculiarities. We find the valves immoveable, and ſoldered together at the angle, in the pinna. The teredo or pipe-worm has the body incloſed in a calcareous tube, and is armed with two little moveable valves, which are uſed in penetrating wood. The terebratula has on the inner part of one of the valves two oſſeous appendages, which ſupport the body.

The contractile membrane which covers all the body of the acephalous molluſca, and is called the mantle, is a real muſcle, preſenting many varieties. Sometimes, and indeed moſt commonly, it is open before, in the direction of the valves, as in the oyſter, the muſcle, &c.; in the ſhells that have two ends always open, as in the razor-ſhells, the gapers, the piddock, &c. it is perforated at both extremities. Laſtly, the cloak may envelope the whole body of the animal, and be open at one end only, as in the aſcidia.

The cloak of the oyſter is compoſed of two pieces of the ſame form as the ſhell; they are fixed to the body poſteriorly, or on the ſide of the hinge, and extend to the edges of the valves. Their ſubſtance is ſoft, ſemi-tranſparent, and furniſhed with a number of muſcular bands: they are perforated by the muſcle, which cloſes the ſhell. One of the edges is in folds, like a flounce, and feſtooned; the other is furniſhed with ſmall conical and contractile tentacula. The cloak of other acephala differs from this deſcription in its general form; in the tentacula on its edge; in the tubes, which are prolongations of it; and, laſtly, in the muſcles which perforate it.

The aperture which ſerves for the expulſion of the feces, and that which receives water and the different aliments, are ſometimes prolonged into a kind of tube, which is a continuation of the cloak: this is called a proboſcis (in French "trompe.") The oyſter, the muſcle, the unio, the anodontites, have only one of theſe apertures, which is the anus. The water merely enters by the large ſlit in the cloak. In the cockle, each aperture is a few lines elongated; that which ſerves for reſpiration is longer and larger than the other. They are ſtill more elongated and unequal in the venus, tellina, mactra, and ſome other genera. The razor-ſhell has likewiſe two; but in the piddock, both tubes are incloſed in a very thick fleſhy proboſcis, through the whole length of which they paſs without uniting.

In the acephala that have the cloak open before, the tentacula are placed at its edge, and in particular towards the anus; but in thoſe which have tubes, they are ſituated at the orifice of the proboſcis. In the edible muſcle (mytilus edulis, Linn.), they are branched.

The valves of ſhells having a continual tendency to open, in conſequence of the action of the elaſtic ligament ſituated at the ſide of the hinge, it was neceſſary that the contained animal ſhould have the power of cloſing them at pleaſure. For this purpoſe they are furniſhed with muſcles, paſſing between the valves at right angles. In the oyſter there is only one muſcle of this kind, ſituated near the centre of the ſhell, behind the liver, and in the middle of the cloak. It is equally inſerted into both valves, paſſing in a ſtraight line between them; and bringing them together, by its contraction, with an aſtoniſhing force. In the moderate ſeparation of the valves, we obſerve the operation of the elaſtic ligament, when the muſcle is relaxed: if we touch the animal, the ſhell is inſtantly cloſed; and we can eſtimate the power with which this is accompliſhed, by the amount of the force required for the forcible diſruption of the valves. The ſame mechaniſm is ſeen in the perna, avicula, and ſpondylus.

There are two muſcles for cloſing the ſhell in the mytilus,

ſolen,

folen, venus, mactra, cardium, &c. They are always feparate from each other towards the extremities of long fhells, and generally approximate at the edge on which the hinge is fituated, in order that a very fmall relaxation may produce a large opening on the oppofite fide.

The common oyfter poffeffes its firft pair of valves, confifting of fingle laminæ, before it leaves the parental organs; the mufcle paffes between the centre of the concavity of each fhell, adhering to each, and it acts on the valves nearly at right angles. The animal has no other continuity with the fhell. As it grows, it augments the margin of its fhells, and thickens them by adding new laminæ on the infide; the mufcular adhefion glides forward, ftill keeping to the centre of the valves.

Many of the teftaceous mollufca have the power of removing themfelves from one place to another, by means of a mufcular appendix, which they can protrude or retract at pleafure, with which they faften themfelves to the fand and rocks, and thus drag themfelves along. This appendix is called the foot of the animal.

The common oyfter, the fpondylus or thorny oyfter, fome fpecies of the fcallop, the anomia, and in general all the mollufca that have fhells with unequal valves, have no foot, and are, therefore, deprived of the means of voluntary locomotion.

One of the moft fimple of thefe feet is that of the frefh-water mufcle (mytilus anatinus, Linn.; anodontites, Cuv.) It is fituated before the body, towards the margin of the fhells. Its form is a compreffed oblong. We obferve on each fide externally a layer of fibres, proceeding from the bottom of the fhell. There are alfo fome internal fibres, which crofs each other at right angles; and others unite the two external layers, to which they are attached in a circular manner. From this difpofition it will eafily be underftood, that the animal may, when it pleafes, change the three dimenfions of the foot, or of one of its parts: by this means, it is enabled to place its fhell flat on the ground, and to crawl along like the fnail by the help of its foot.

The mufcle may be obferved to open its fhell, to put forth the foot, and elongate it, to feel about with it. The animal fixes it to fome object, and drags the fhell after it. The animal called by the French lavignon, alfo a bivalve, puts forth a broad flat foot, by which it makes its way into the fand or mud. It has two long tubes, which keep up its communication with the furface, for the purpofe of refpiration. The holes correfponding to them fhew where the animal is. See Reaumur, "Du Mouvement progreffif, et de quelques autres Mouvemens de diverfes Efpèces de Coquillages, Orties, & Etoiles de Mer," in the Acad. des Sciences, 1710, with feveral figures, and detailed explanation of the fubject, both fo far as concerns the animals juft mentioned, and fome others.

We find this fimple foot in the piddock. Its form is almoft fpherical, and tunicated by a flat furface. The part which Linnæus has obferved in the razor-fhells, and which he has compared to a glans in its prepuce, is the foot, by which the animal buries itfelf in the fand, or rifes to the furface. In thefe two genera, the foot is protruded at the aperture of the fhell, which is oppofite to that through which the tubes pafs. See Reaumur in the Acad. des Sciences, 1712, with figures.

The foot of the cardium or cockle is fomewhat complex. It has a triangular appendix, which is capable of inflexion, of feizing with its point the glutinous matter, and drawing it out into threads. But the foot of the fea-mufcle (mytilus edulis) is the moft remarkable in its organization. It refembles a fmall tongue, marked with a longitudinal furrow, fufceptible of confiderable elongation, and of being fhortened into the form of a heart. This organ is moved by five mufcles on each fide. Two arife from the extremities of the fhell, near thofe which clofe it; the other three come from the bottom of the fhell, and the depreffion for the nates. They are all inferted into the foot, with the fibres of which they are interwoven, in the fame manner as the external mufcles of the human tongue join the lingual. The organ is completely enveloped in a fheath formed of tranfverfe and circular fibres, of an obfcure purple colour. This foot is employed both in fpinning and crawling: the laft office is performed as in all the other bivalves. It accomplifhes the firft by feizing with its point the gluten fupplied by a gland fituated under its bafe, and drawing it out into threads, in the above-mentioned furrow. The gland that fecretes this humour, of which the thread is formed, will be defcribed hereafter.

The organs of motion in worms are not fo perfect as in the larvæ of infects; having neither fcaly nor membranous feet, feveral of them crawl or drag themfelves along by the help of ftiff hairs or briftles, with which they are wholly or partly covered: of this defcription are the genera aphrodita, terebella, nereis, lumbricus, &c. Two kinds of mufcles contribute to their motion.

The one extends the whole length of their body, and forms four principal fafciculi, two of which belong to the belly, and two to the back. Thefe four mufcles may be faid to conftitute the mafs of the body. We find them immediately under the fkin. Their fibres are parallel; but their length does not exceed that of the rings, being interrupted in the folds of each ring by a very compact cellular tiffue. The ftructure of thefe mufcles is, however, moft diftinctly obferved in the infide. We there find that they are feparated from each other by a longitudinal line, and enveloped in a kind of fac of a clofe cellular fubftance, which correfponds to each ring of the body. Thefe four mufcles produce the principal motions. Where thofe of the back contract wholly or partially, they raife the portion of the body to which they belong: the fame effect, but in the oppofite direction, is produced by the conftruction of the ventral mufcles.

The fecond order of mufcles is appropriated to the motions of the fpines or briftles. Their number is equal to that of the tufts of hairs. The defcription of one of them will be fufficient to give us a knowledge of the whole.

The hairs, briftles, fpines, &c. which project from the bodies of thefe animals, are manifeftly moveable. They are retracted, and pufhed out at pleafure. The mufcles which produce thefe motions are vifible only when the animal is laid open, the inteftinal canal taken out, and the fkin ftripped off. We then obferve that each tuft of hair is received in the concavity of a flefhy cone, the bafe of which is attached to the longitudinal mufcles, and the apex to the internal extremity of the hairs. All the fibres which form this cone are longitudinal, but enveloped by a compact cellular fubftance. They move the hairs outwardly, and in the direction which their contraction may determine. This firft clafs of the mufcles, which belong to each branch of hairs, may be called the protractors of the fpines.

The fpines are withdrawn within the body by another fet of mufcles, which may be called retractors. They have fewer fibres than the former; their action therefore is feeble. They are fituated under the internal furface of the long mufcles, at a fhort diftance from the holes with which the latter are perforated for the paffage of the hairs. They are inferted into the tufts of fpines, nearly on a level with the point, which thefe reach, when completely retracted. It

may be conceived that the protractors, when they act, push the retractor outwards; but the latter, when contracting in its turn, tends to recover the parallel situation of its fibres, and thus draws the spines inwards. It is by the help of these muscles, and of the spines on which they act, that the imperfect locomotion of these worms is effected.

There are other worms, destitute both of spines and bristles; and therefore possessing a different muscular organization. Their manner of crawling differs considerably from that of the former. Their progression is accomplished by means of the two extremities of their bodies, which they apply alternately to the surface on which they crawl. They are fitted for this kind of motion by a peculiar structure. We may divide them into two orders.

The first, as the leeches, and several intestinal worms, have the head and the tail terminated by a kind of contractile fleshy disk, somewhat resembling those of the arms of the cuttle-fish. The structure of these two disks, which perform the office of suckers, cannot be easily ascertained; for when the skin which covers them is removed, we observe merely some very small fibres interwoven in different directions.

Though the worms with suckers possess a great power of contraction, it is extremely difficult to trace the muscles that move their bodies. Their whole skin may indeed be regarded as one muscle, or kind of fleshy sac, furnished with circular and longitudinal fibres, and containing the vessels, viscera, and glands. This muscular skin is thick, and lined with a very solid and compact cellular substance.

When the worm wishes to change its place, the body is fixed at one of the extremities, by means of the sucker that terminates it; the circular muscles of the skin then act, which elongates the animal's body by diminishing its diameter: when the free extremity has in this manner reached the place to which the worm chooses it should be extended, it is applied and made fast to that spot by the sucker, and becomes the fixed point of a new motion: the animal having detached the sucker first made use of, draws it by the operation of the longitudinal fibres of the skin towards the second sucker, and proceeds in this manner to fix each extremity alternately. This is the mechanism by which progression is effected in worms that have terminating disks.

The second order of worms, which move by fixing their extremities, includes the greater part of the intestinal kind. These possess less contractile power than the leeches, and their motions are therefore less extensive. Their head, instead of being terminated by a disk, is sometimes provided with hooks, by means of which they fix themselves to the parts they suck. Such are the common tænia, the tænia solium, the hydatigena, the hæruca, the echinorhynchus, the uncinaria, &c. &c. The disposition and number of the hooks, which vary considerably, have been described by naturalists.

The Organs of Motion in Zoophytes vary considerably in their nature, form, and action. It is necessary, therefore, in order to obtain a just notion of these organs, to take a particular and successive view of them in certain orders of those animals.

The echino-dermata are distinguished by numerous retractile feet, and a covering more or less solid. These feet are a kind of suckers, and have nearly the same organization in the three genera which compose this order. In their form, they resemble a globular phial or ampulla: they are filled with a fluid, and their parietes are formed of circular fibres. The elongated or tubular portion of the ampulla is the only part that appears externally, when the feet are extended. It is terminated by a kind of disk, which is concave in the middle. The spherical portion is situated within the body. From this construction of the foot, the mechanism of its action will be easily understood. The liquor contained in the ampulla becomes, by a change of place, the cause of motion: when the foot is drawn into the body, the spherical portion of the ampulla is greatly enlarged: when the foot protrudes, the parietes of the ampulla contract, and impel the contained fluid into the tubular part, which consequently increases both in length and circumference. In the retractile motion of the foot, the tunic of the tube is contracted, and the liquor thereby forced back into the body of the ampulla. The number of these feet vary considerably in the different genera and species.

The holothuriæ are covered with a thick coriaceous skin, which the animal can lengthen or shorten at pleasure. These two motions are produced by longitudinal muscular bands, varying in length and breadth in different species, and smaller transverse bands extended over the whole internal surface of the body. The animals included in this genus have their feet disposed in different manners, and in some species they are even wanting. In others we find them either spread irregularly over the whole body, situated upon one side only, or placed in longitudinal rows.

In the asteriæ, or sea-stars, the covering of the body has a close fibrous texture, the interstices of which are filled with grains of calcareous matter of various forms and dimensions. This kind of crustaceous skin is however susceptible of a certain motion, which, though slow, is very remarkable. The body of the animal is commonly divided into five branches, to which the feet are attached. These last are ranged in several files throughout the whole length of the branches from the mouth. The branches are sometimes furnished with spines, their middle portion is frequently entirely calcareous, but articulated at its origin, and moveable upon the central part of the body.

Reaumur counted 1520 legs in a star-fish; yet their motion is extremely slow. These legs can be extended or withdrawn, or partly thrust out: when withdrawn, their extremity is visible. Mem. de l'Acad. des Sciences, 1710, p. 487.

The echini, or sea-eggs, are encrusted by a complete calcareous shell, the surface of which is covered by tubercles disposed in a very regular manner. Moveable spines of various shapes and sizes are articulated to these tubercles. It is very difficult to discover the fibres by which the spines are moved at the will of the animal; for in their joints we observe only a solid ligamentous substance, which cannot be easily cut. The feet are protruded through holes which perforate the shell with much regularity, and form uniform parallel lines, called by naturalists ambulacra. They are very numerous, but produce, as in the asterias, only a very slow motion.

The medusæ swim, by displacing the water with alternate motions, rendering their bodies now flat, now convex. Reaumur has a figure of one; Acad. des Sciences, 1710, p. 478, pl. 11.

"Although," says Péron, "the medusæ are composed of a homogeneous jelly, without any appearance of fibres, they possess a truly surprising power of contraction. Constantly active on the surface of the waters, we see them alternately contracted and developed. When the animal comes from below towards the surface, he strikes from above downwards, and thus raises himself in consequence of the resistance of the water to this motion of his umbella. In order to change the direction of his course, he is inclined, so that the umbella forms a more or less acute angle with the horizon; in this case the direction of the stroke, and consequently the resistance being oblique, he is urged forwards in the

the fame direction. When he has reached the furface, the vertical pofition can have no other effect than that of retaining him in the fame pofture and place: to change it, he muft again incline his body. In this way, all the medufæ with gelatinous and orbicular bodies fwim: the umbella remains parallel to the horizon only in the ftate of reft, or at leaft of relative repofe. Defcending in the water is accomplifhed very fimply: their fubftance being fpecifically heavier than that of fea-water, it is only neceffary that they fhould contract themfelves powerfully, fo as to contract their dimenfions in every direction, and they fink of themfelves. Sometimes, in order to go down more quickly, they turn themfelves over; fo that the upper convex part of the umbella is downwards." Annales du Muféum, tom. xv. p. 41.

The coriaceous fkin which covers the actiniæ, poffeffes fo extraordinary a power of contraction, that thefe animals can affume at pleafure the moft diffimilar forms. Sometimes they are flattened into a difk; fometimes elevated into a cone; fometimes lengthened into a cylinder, &c. &c.

"They can walk," fays Reaumur, "in two ways; firft, by means of their bafis, of which they can change the figure, dilating or contracting it in different directions, fo as to move forwards the body flowly." Reaumur defcribes this at great length; Acad. des Sciences, 1760, p. 470, et feq. "I have alfo," fays he, "feen them walk upon their tentacula. They were the kind that live in holes of rocks, and poffefs long tentacula in proportion to their fize. In this cafe the animal is inverted, the bafis being upwards. The tentacula are very vifcous, and even rough to the touch, fo as to be well calculated for the purpofe." P. 475. He has reprefented them in the different forms which they can affume, in fig. 21—26.

In frefh-water polypes (hydra), we obferve moveable tentacula about the mouth, which feem principally deftined to feize their prey. The animal has the power of locomotion. The fmallnefs and tranfparency of parts in the other genera do not allow of our difcovering the mechanifm by which motion is produced.

The two following memoirs of Reaumur, in the Academy of Sciences, contain the beft account of the motions of thefe animals, and they are illuftrated by feveral figures. "Du Mouvement progreffif, et de quelques autres Mouvemens de diverfes Efpèces de Coquillages, Orties, et Etoiles de Mer," 1710, p. 439; "Obfervations fur le Mouvement progreffif de quelques Coquillages de Mer, fur celui des Heriffons de Mer, et fur celui d'une Efpèce d'Etoile," 1712, p. 115.

Nervous Syftem.—Animals without vertebræ are not formed on a common plan, either with refpect to the nerves or mufcles; they prefent difparities fo great, and indeed are fo deficient in common characters, that we are obliged, without making any general obfervations, to confider the nervous fyftem in the different claffes and the principal genera.

Brain and Nerves of the Cephalopodous Mollufca.—In the fepia octopus, the cuttle-fifh, and the calmar, the nervous fyftem appears to refemble in fome refpects that of red-blooded animals. The brain is inclofed in a particular cavity of the cartilage of the head, which is pierced by a number of holes to give paffage to the nerves. The cartilage of the head has the form of a hollow and irregular ring; its pofterior part is the thickeft, and contains the brain; its anterior part contains the ears, and a femicircular canal which communicates on each fide with the cavity of the brain, and includes the medullary collar. The œfophagus paffes through the centre of this cartilaginous ring, and is confequently, as in all white-blooded animals, furrounded by the medullary cord. The lateral parts of the cartilaginous ring have eminences which form a kind of orbit on each fide.

The brain is divided into two diftinct parts; one next the œfophagus, the furface of which is fmooth, and the other towards the back, which is round, and marked by longitudinal ftriæ. The medullary collar arifes from the lateral parts of both portions: in the octopus it is in the form of a lamina, the anterior part of which produces four large nerves, which, with the four correfponding nerves, proceed forward into the eight feet, which crown the head. Thefe laminæ are joined inferiorly, and thus furround the œfophagus. Two other principal pairs of nerves arife on each fide, near the origin of the collar. The firft or optic pair extends directly into the orbit, paffes after a fhort courfe through the fclerotic coat, and is there dilated into a ganglion larger than the brain, fhaped like a kidney, with the concave fide turned towards the brain. The fubftance of this ganglion appears to be the fame as that of the brain: its convexity produces a multitude of fmall nerves, as fine as hairs, which pafs through the choroides, by an equal number of fmall holes, to form the retina. The fecond pair belongs to the mufcles of the fac; it originates a little above the preceding pair. Thefe nerves defcend obliquely, and after leaving the cerebral cavity, pafs between the mufcles, which fuftain the head, to the lateral part of the fac, near its fuperior edge, between the body and the branchiæ. It then divides into two branches, one of which defcends to the bottom of the fac, the other dilates into a roundifh ganglion, which produces a multitude of nerves, difpofed like radii. Thefe are diftributed to all the flefhy fibres of the fac and the fins.

The anterior and inferior part of the collar gives origin to two pairs of nerves. The firft or auditory are very fhort, as they only traverfe a cartilaginous lamina to penetrate the ear, where they are diftributed. The fecond pair iffues from the cartilage by two holes placed near each other, and beneath the ears: the two nerves which compofe it defcend within the peritoneum to the bottom of the fac. When they arrive near the heart, they form a complicated plexus, from which all the nerves of the different vifcera proceed.

Each foot has a nerve, which paffes from one extremity to another, like an axis, and occupies a canal, which we have defcribed in fpeaking of the mufcles. This nerve is enlarged, at different fpaces, by numerous ganglia, which have the appearance of tubercles, and from each of which ten or twelve nervous filaments proceed: thefe diverge and penetrate the mufcles of the interior of the foot, to which they diftribute branchiæ; but the chief ramifications are fpent on the fuckers.

This defcription is taken from the octopus: the other cephalopoda differ only in having a brain lefs diftinctly divided, and prefenting lefs confpicuous furrows.

Nervous Syftem of the Gafteropodous Mollufca.

In the Snail (Helix Pomatia.)—The brain is fituated upon the œfophagus, behind an oval mafs of mufcles, which envelop the mouth and the pharynx. Its fhape is nearly femilunar, with the concavity backwards. The angles of the crefcent are prolonged on each fide into a branch, by which the œfophagus is encompaffed in a collar. The falivary glands, and the mufcle which retracts the mouth and brain, pafs alfo through this collar. The two cords produced by the brain unite below the œfophagus and mufcle in a large round ganglion, which is more than one-half the fize of the brain. All the nerves proceed from one or other of thefe two maffes. Thofe furnifhed by the brain proceed from the lateral

lateral parts of its convex fide. There are, firft, two nerves for the flefhy part of the mouth; next, one on each fide for the fmall horns; then two for each great horn, one of which proceeds to the bafe of that horn, and paffes into its mufcular fubftance; the other goes to the eye. The latter is folded confiderably on itfelf, when the horn is drawn inward. There are befides fome other filaments, which extend to the bafe of the parts of generation, and to the mufcles which move the head. The large inferior ganglion produces at firft three great nerves, one for the penis, another for the brain, and a third for the mufcles, which draw the whole animal into its fhell. The inferior furface of this ganglion afterwards produces two great fafciculi, which proceed backward, and which, after paffing between the two mufcles before mentioned, are diftributed to all the flefhy parts of the foot.

Swammerdam's figure of the nerves of the fnail appears to have been taken from the flug.

In the Slug (*Limax Rufus.*)—The brain is alfo fituated behind the œfophagus in this animal, but it has the form of a narrow ribbon lying crofswife. It enlarges a little at its lateral parts, each of which produces a filament to encircle the œfophagus. The ganglion, which is formed by the union of thefe two filaments, is larger than the brain.

Two principal trunks proceed, each on its refpective fide, in a ftraight line from this ganglion. They extend along the lower part of the body, throughout its whole length, preferving nearly a parallel direction. On the external fide they each detach a number of filaments, which penetrate into the flefhy fubftance of the fkin. A great number of other filaments alfo proceed immediately from the inferior ganglion to the fkin. Further, the inferior ganglion fends off two nerves on each fide, which go to the vifcera, and follow the diftribution of the arteries.

With refpect to the brain, properly fo called, it furnifhes in the firft place a nerve on each fide for the flefhy mafs of the mouth; then two for each of the great horns, one of which extends to the eye, and becomes the optic nerve. The nerves of the fmall horns arife more outwardly.

In the Aplyfia.—This is a fmall marine animal, very like the flug, but refpiring by means of branchiæ, which form a kind of tuft on the back, and are covered by a particular operculum. The brain is fituated as in the fnail; but the branches, which furround the œfophagus, produce two ganglia, one on each fide, which are conjoined by a fmall filament.

The brain furnifhes, at its anterior part, two flender filaments, which encircle the flefhy mafs of the mouth, and unite under it in a fmall ganglion, whence the nerves of the lips are detached. The brain afterwards affords nerves to the horns and the eyes, which are in this animal fituated between the horns, and to the parts of generation. The two lateral ganglia tranfmit a multitude of nerves to all the flefhy parts of the foot and fkin; they alfo produce each a long cord, which unites to its correfponding cord on the aorta, near the part where it arifes from the heart; there they form a ganglion, from which all the nerves of the vifcera proceed.

In the Clio Borealis.—This fmall animal has no foot, and can only fwim. It refpires by two branchiæ, in the form of wings, fituated on the neck; but in other refpects it very much refembles the flug. Its nervous fyftem is analogous to that of the aplyfia.

Its brain is formed of two roundifh lobes: it furnifhes immediately nerves to the tentacula, and gives origin to a double collar. The anterior extends, as in the aplyfia, under the mouth, to form a fmall ganglion. The pofterior has a ganglion on each fide, which furnifhes nerves to the mufcular fkin that furrounds the body; each of thefe produces one or two other ganglia, which fend nerves to the vifcera.

In the Doris.—This is alfo a fmall marine animal fimilar to the flug, but it refpires by external branchiæ difpofed like ftars round the anus. The brain is very large in proportion to the reft of the body, and particularly in comparifon with that of other gafteropoda. It is elongated tranfverfely, and of a fquare form. It is fituated immediately above the origin of the œfophagus, behind the orbicular mafs of mufcles, which form the parietes of the mouth.

Six nerves proceed from the brain on each fide; one pair is deftined for the mufcles of the mouth, another for the tentacula. The third is a cord, which paffes below the œfophagus, and is loft in the mufcles of the foot, where it may be very diftinctly obferved on the lateral parts of the internal furface. The fourth and the fifth are directed above the mafs of inteftines, and proceed to the fkin of the back. Laftly, the fixth terminates in the parts of generation.

In the Scyllæa.—This is another marine animal fimilar to the flug, but refpiring by branchiæ in the form of wings arranged by pairs on the back: it crawls on a furrow in its belly. The collar furrounding the œfophagus is a fimple cord, and does not enlarge into a ganglion as it proceeds downward. The brain, which is above it, is of an oval form; it fends nerves to the mouth and to the horns, but there are no optic nerves, as this animal has no eyes. The nerves of the vifcera arife from the inferior part of the collar, and thofe of the mufcles from its fides.

In the Sea-Ear (*Halyotis Tuberculata.*)—This animal has no ganglion above the œfophagus to fupply the place of the brain. We find merely a nervous filament, fituated tranfverfely above the œfophagus, behind the mouth. Four fmall ramifications proceed from the middle and anterior part of this filament, two on each fide, and are loft in the parietes of the mouth. At each extremity of the tranfverfe nervous filament there is a very large flat ganglion, from the circumference of which a number of nerves are detached to the adjacent parts. Three filaments pafs off on each fide from the external furface of this ganglion: one is fent to the fetiform tentaculum, fituated above the mouth, the other two proceed to the flat tentaculum, like a buckler, placed more pofteriorly and on the fides. The moft pofterior appears to be intended for the eye: it is the thickeft, the other feems loft in the mufcular parts.

A very remarkable filament is detached from the fuperior parts: it proceeds above the œfophagus, and joins the correfponding one on the other fide. There is a fmall enlargement at the point of union, from which four nerves proceed, two on each fide of the middle line. The moft external is loft in the mufcles of the tongue; the other purfues the middle line of the œfophagus, and is ramified over the inteftines. Several fmall branches are detached inferiorly, and terminate in the fan-like mufcles that fuftain the tongue.

Laftly, the ganglion is prolonged pofteriorly into a thick nervous cord, fituated on the fides and below the œfophagus, which becomes flat, as it proceeds backward: it defcribes a femilunar curve, fo that the two nerves of the oppofite fides are approximated, and finally touch each other at the bafis of the tongue, and below the anterior part of the large mufcle which attaches the animal to its fhell. The union of thefe two nerves produces a ganglion, from which two very remarkable trunks, intended for the inteftines, proceed; they can be followed to above the ftomach, and we can perceive that fome of their ramifications enter the liver. After the

the formation of the ganglion, which furnishes nerves to the viscera, the two trunks penetrate by two different holes into the substance of the muscle of the foot. These two holes are the origin of two canals, which run throughout the whole length of the foot, on the sides of another middle canal, which appears destined to distribute the blood of the animal. The two nerves, lodged in the lateral canal, are distributed by a great number of lateral holes into the substance of the fleshy muscles of the foot, and of the shell, where they may be followed with facility.

In the *Helix Stagnalis* and *Helix Cornea* (*Planorbis Cornea*), the brain consists of two lateral masses, separated by a contraction. In the living animal they are of a lively red colour. The distribution of the nerves differs very little from what we observe in the common snail.

Nervous System of the Acephalous Mollusca.—It is formed on a plan far more uniform than that of the gasteropoda. In all the testaceous acephala, from the oyster to the pholas, and the teredo, there appears no essential difference: it consists always of two ganglia, one on the mouth representing the brain, and another towards the opposite part. These two ganglia are united by two long nervous cords, which take the place of the usual collar, but which occupy a much greater space at the foot where it exists, and the stomach and liver always pass in the interval between them. All the nerves arise from the two ganglia.

In the Anodontites, or Fresh-water Muscles, in Cockles, in the Venus, Mactra, and Mya.—In these, and generally in all the bivalves which have two cylindrical muscles, one at each extremity of their valves, for the purpose of bringing them together; the mouth is placed near one of those muscles, and the anus near the other. The foot appears about the middle of the shell; and the tubes for the excrements and respiration, when they exist, go out at the end of the shell opposite to that in which the mouth is situated. The brain is placed at the anterior edge of the mouth; it is oblong transversely; it sends off two cords anteriorly, which go to the adjacent muscles, and turning towards each side, penetrate the lobes of the cloak, passing through the whole extent of their edge. The brain furnishes also, on each side, some filaments to the membranous tentacula, which surround the mouth, and detaches, from its posterior edge, the two cords analogous to the medullary collar in other invertebral animals. These cords proceed, each on its side, under the muscular stratum which envelopes the liver and the other viscera, and which becomes thicker as it is continued to form the foot, which is frequently constructed for spinning. When arrived at the posterior muscle which closes the valves, these cords approach each other, and enlarge as they unite to form the second ganglion. This ganglion has the form of two lobes. It is at least as large as the brain ganglion, and always much more easily distinguished. It detaches two principal nerves on each side, and the four together represent a kind of cross. The two anterior nerves, as they ascend, proceed a little towards the side of the mouth, and after having described an arc, penetrate into the branchiæ. The other two pass on the posterior muscle, precisely in the same manner as those of the brain on the anterior. After detaching some filaments they proceed into the cloak, the edge of which they follow until they join those of the brain; they thus form a continued circle. We do not yet know the origin of the visceral nerves in these animals.

The testaceous acephala, in which the foot is protruded by an extremity of the shell, that always remains open, and the tubes by the opposite extremities, that is to say, in razor-fish and piddocks, the mouth, and consequently the brain, is always near one extremity. The nerves which proceed from the brain, take therefore a longer course before they diverge to join the cloak. The cords of the collar, however, have a much shorter distance to pass before they unite. There is a considerable space, particularly in the razor-fish, between the mass of the viscera situated in the base of the foot, and the posterior muscle. The second ganglion is situated in the middle of this space, between the branchiæ of each side: it is round, and much more distinct than in the other species; the nerves it produces are however exactly similar.

In the oyster, which has no mouth at the anterior part, the brain and mouth are situated under the kind of hood which the cloak forms towards the hinge. The nerves go directly into the cloak itself. The ganglion is situated on the anterior surface of the single muscle, immediately behind the mass of viscera. The nerves it produces are the same as in the preceding genera.

In the Ascidia.—These small marine animals are enveloped in an immoveable coriaceous or gelatinous case, which has two apertures; one for the expulsion of the excrement, the other for the admission of water to the branchiæ. The branchiæ are in the form of a large sac, and are inclosed, as well as the other viscera, in another membranous bag, of the same form as the external case, but smaller, and completely adhering to that case at the two apertures only. The inferior ganglion is situated on this membranous sac; its position is between the two apertures, but nearest that which corresponds to the anus; it produces four principal nerves: two ascend towards the superior or respiring aperture, the other two descend towards that of the excrements. There are smaller nerves dispersed through all the membranous sac. We have not yet discovered those produced by the brain, nor the brain itself, which is doubtless situated as usual on the mouth. The mouth is in the bottom of the branchial sac.

In the Tritons of Linnæus, which inhabit the anatiferous and balanite Shells, (Lepas, Linn.) — These animals approach perhaps nearer to the crustacea, and particularly to the monoculi, than to the mollusca. Their nervous system is a sort of middle kind between that of the mollusca, and that of the crustacea and insects.

The brain is placed across the mouth, which is itself situated in the part of the body corresponding to the ligament, and at the bottom of the shell. It produces four nerves to the muscles situated in that place, and to the stomach, and two others which embrace the œsophagus, and proceed into that elongated portion of the body which bears the numerous articulated and ciliated horny tentacula which the animal protrudes from its shell. These two filaments approach, and form a ganglion, and then proceed close to each other among these tentacula, furnishing a corresponding pair of nerves for each pair of tentacula; but there are no apparent ganglia at the origin of these nerves.

The general result from the preceding statements is, that the nervous system of the mollusca consists in a brain placed on the œsophagus, and in a variable number of ganglia, sometimes approximated to the brain, and sometimes dispersed in the different cavities, or placed under the muscular envelopes of the body: that the ganglia are always connected to the brain and to each other by nervous cords, which establish a general communication between these different medullary masses: that the nerves all arise either from the brain or the ganglia: and lastly, that there is no part which can be compared to the medulla oblongata and medulla spinalis.

Nervous System of Worms.—Some genera present a very

diftinct nervous fyftem, organized nearly like that of the cruftacea and infects. In others, however, that fyftem becomes fo obfcure, that we can fcarcely recognife its exiftence. Thus the clafs of worms, which in feveral of its genera ranks above infects, with refpect to the organs of circulation, is reduced almoft to a level with the zoophytes, when confidered with regard to the organs of fenfation.

The *Aphrodite aculeata* has a very diftinct nervous fyftem. Immediately behind the tentacula, fituated above the mouth, we obferve a large nervous ganglion, which is the brain; it has the form of a heart, the broadeft and bilobed part of which is directed backwards. The pointed anterior portion produces two fmall filaments for the tentacula, and the lateral parts fome other filaments, which are ftill more flender, for the parietes of the mouth. This ganglion is fituated immediately above the origin of the œfophagus. The two cords which arife from the brain, and from the collar, are very long and delicate; they gradually increafe in thicknefs as they approach the point of their union. Each then produces a large filament, which we fhall call the recurrent nerve; thefe nerves are very diftinct: they are directed forward towards the part where the œfophagus, which is very fhort, joins the ftomach. They may be eafily followed by the naked eye to the lateral parts of that vifcus, which is very long and mufcular; before they reach the inteftines that follow the ftomach, they fwell into a ganglion, which produces a great number of nervous fibrils.

The two curves of the collar produce a very large ganglion at their union; it is bifurcated anteriorly, and fituated immediately behind the mouth, and above the œfophagus; it is the anterior extremity of the chief nervous cord. We do not obferve any filaments proceeding from it. To this firft ganglion another fucceeds, which is diftinguifhed from it only by a fmall contraction; the latter produces two nervous filaments, which go forwards into the mufcles of the abdomen. A feries of ganglia, the fpaces between which are confiderably greater, afterwards fucceed; each of thefe fends off fix nerves, three on a fide, which are loft in the mufcles. Thefe ganglia are twelve in number. The nervous cord, which fucceeds, and which occupies the pofterior third of the body, no longer exhibits any apparent enlargement; but pairs of nerves are ftill detached at certain fpaces. Finally, this cord may be followed to the extremity of the body.

In the *Leech*, the nervous fyftem is a longitudinal cord, compofed of twenty-three ganglia. The firft is fituated above the œfophagus; it is fmall and rounded; anteriorly it produces two flender filaments, which proceed above the difk of the mouth. The lateral parts furnifh a thick pair of nerves, that form a collar round the œfophagus, as they proceed downward, and unite at the fecond ganglion. This ganglion is of a triangular figure, and appears to be formed by the union of two tubercles. Two of thefe angles are anterior and lateral; they receive the nerves that proceed from the firft ganglion. The other is pofterior; it is prolonged into a nerve rather more than half a line long, which produces the third ganglion: the anterior part of the triangular ganglion which we defcribe, detaches two fmall nerves that are loft on the œfophagus, around the mouth. The nine fucceeding ganglia are precifely of the fame form, and produce each two pair of nerves; they differ only in the greater or lefs diftance at which they are placed from each other. The third, as we have obferved, is very near the fecond. The three following are at the diftance of nearly a line and a half: but thofe which fucceed, from the feventh to the twentieth, are at the diftance of three or four lines; finally, the three laft are very clofe together.

All thefe ganglia are fituated longitudinally below the inteftinal canal, to which they furnifh, from their fuperior furface, a number of nervous filaments; they produce on each fide two nerves, which pafs into the longitudinal and tranfverfe mufcles, in the fubftance of which they are loft. Thefe nerves run in oppofite directions, fo that they reprefent the figure of an X. The coat of thefe nerves is black, and very folid, fo that before the parts have been immerfed in alcohol, they appear like a fyftem of veffels.

The nervous cord of the *Earth-worm* derives its origin from a ganglion fituated above the œfophagus: this ganglion is formed of two clofe, but very diftinct tubercles. It produces a pair of fmall nerves proceeding to the parietes of the mouth, and two large cords, which embrace the œfophagus in the form of a collar: thefe unite to form the nervous cord, the origin of which therefore appears bifurcated. Three pair of fmall nerves are detached at this place: one from the cord itfelf, and the others from its lateral parts. They all proceed into the mufcles of the mouth. The nervous trunk is continued to the anus, along the inferior part of the inteftine; its fize is not fenfibly diminifhed, and the contractions are not very remarkable: there are, therefore, no real ganglia. A pair of nerves arifes between each of the rings of the body; thefe nerves pafs under the longitudinal mufcles, and difappear between them and the fkin. When the nervous cord reaches the anus, it terminates by forming a plexus, which is loft on the parietes of that aperture.

In the *Gordius argillaceus*, there is only a fingle nervous cord, fimilar to that of the earth-worm, but its contractions are ftill lefs apparent.

The *Nereis* and *Terebella* have, within the fkin of the belly, a longitudinal cord, which may be regarded as nervous: it has as many contractions as there are rings in the body. No nervous filament has been obferved proceeding from this cord.

In the *Sea-worm* (*Lumbricus Marinus, Linn.*), which in its external characters approaches nearer to the nereis than to the lumbricus, the nervous fyftem is the fame as in the nereids, but the cord gradually increafes in thicknefs towards the middle of the body, where it is much more diftinct.

In the Afcaris Lumbricoides of Man and the Horfe. — This animal appears to have two nervous cords; they are obfervable throughout the whole length of the body, on the lateral parts of the abdomen. They unite above the œfophagus, exactly at its origin on the mouth; they are very flender, and produce no remarkable ganglion: they are fmaller at their origin than towards their extremity, that is to fay, towards the anus; but they are equal, and precifely fimilar to each other with refpect to their different parts. We obferve at firft fome fmall granular points, which enlarge in proportion as the nerve defcends. When it has reached the middle of the body longitudinally, it forms fquare ganglia, at a fhort diftance from each other. Laftly, towards the termination, for the length of nearly fix lines, the nerve becomes more and more flender, and ends in a very fmall filament, which unites with that of the other fide.

Thus we find an evident analogy in the organization of the nervous fyftem of cruftacea, infects, and worms, no lefs ftriking than that which prevails in the external forms, in the difpofition of the mufcles, and the fingular divifion, into a feries of rings or fegments, which we obferve in thefe animals. This analogy prevents us from eftablifhing between thefe three claffes limits equally diftinct with thofe which fubfift between them and the mollufca. The uniform diftribution

diſtribution of nearly equal ganglia upon a cord, extending throughout the whole length of the body, ſeems deſigned to furniſh each ſegment with a brain peculiar to itſelf. Thus we are gradually conducted to that general diffuſion of the medullary ſubſtance, which ſeems to take place in zoophytes.

Animals in which no diſtinct Nervous Syſtem has been yet diſcovered.—We do not, ſays Cuvier, include in this diviſion the animals of the claſs of worms, or the molluſca, in which the minuteneſs or ſoftneſs of the parts have not yet permitted us to trace the nervous ſyſtem. Analogy will not allow us to doubt its exiſtence, when the parts which accompany it uniformly exiſt.

Thus the flukes (faſciola) having veſſels, or liver, &c. muſt be ſuppoſed to have nerves alſo, though we have hitherto been unable to demonſtrate them. We even doubt not the exiſtence of a nervous ſyſtem in ſeveral inteſtinal worms, particularly thoſe which have a cylindrical form, which we ſuppoſe to have a medulla nearly ſimilar to that deſcribed in the large aſcarides. It is found in the gordius; why ſhould it not exiſt in the echinorhynchus, ſtrongylus, &c. &c.?

But there are animals, in which analogy affords us no aſſiſtance, to whom we cannot aſcribe a nervous ſyſtem, unleſs we diſtinctly obſerve it: there are ſome inteſtinal worms, very different in form from thoſe we have mentioned, and the greater part of zoophytes.

The aſterias has parts very ſimilar to nerves; but Galvanic experiments ought to be made on living individuals, to prove completely their nature. Round the œſophagus we obſerve a girth of a ſoft whitiſh ſubſtance, which produces ten filaments, two to each of the branches, which form the body of the ſtar. The two filaments belonging to each branch having arrived at the baſe of the offeous and articulated ſtalk, which ſerves for the principal ſupport of the animal, unite to form a ſhort cord, which extends directly from one to the other: they afterwards both continue along the ſtalk to the extremity of the branch, diminiſhing always in thickneſs. At the place where they are united, each produces a faſciculus of filaments, which are diſtributed to the ſtomach, which, in theſe animals, is ſituated in the midſt of the body, between the five branches. The appearance of all theſe filaments is rather tendinous than nervous, and that circumſtance chiefly has hitherto prevented us from forming a decided opinion of their nature.

In the *Holothuria*, properly ſo called, among which we do not include either the thalia, or the holothuria phyſeter of Linnæus, we find ſomething ſimilar to what we have deſcribed in the aſterias; but the appearance of the cord is much more nervous, and this is a ſtrong confirmation of our conjectures.

The parts we allude to are ſeen moſt diſtinctly in the ſpecies of holothuria which have five longitudinal pairs of muſcles, as the priapus and pentacta. Between the two muſcles, which compoſe each pair, there is extended a white cord, ſlightly ſerpentine, and marked by tranſverſe rings, like common nerves. The five cords enlarge as they proceed towards the œſophagus, where they ſeem to unite and ſurround the canal.

The *Sipunculus* is more ſimilar to the holothuria than to any other animal, though naturaliſts have hitherto placed them next the lumbricus. They have only a ſingle whitiſh cord, but it completely reſembles thoſe of the holothuria, and it proceeds, in the ſame manner, to embrace the œſophagus by its anterior extremity.

If the parts now mentioned are real nerves, it will be neceſſary to ſeparate the echino-dermata from the other zoophytes, and eſtabliſh them as a diſtinct claſs.

In the *Sea Urchins* (*Echinus*), nothing ſimilar to nerves has been obſerved: the ſame remark may be extended to the actiniæ and meduſæ.

With reſpect to the polypes, both the freſh-water kind and thoſe which belong to the corals, &c. we have already obſerved that their bodies exhibit only a gelatinous and homogeneous pulp, in which no particular arrangement of organs can be diſcerned. All theſe animals have however diſtinct ſenſations: their ſenſe of touch is very delicate; they not only perceive the motions which agitate the water in which they live, but they completely feel the degrees of heat and light. The expanſion of the actiniæ correſponds preciſely to the ſerenity of the atmoſphere. The hydra perceives very diſtinctly the preſence of light; prefers it, and conſtantly turns towards it. The microſcopic animals appear to approach in ſome meaſure the nature of polypi, by their uniform and gelatinous ſtructure. There are ſome, however, in which we obſerve a more complicated organization, and ſeveral kinds of internal viſcera; but it will be obvious, that we have no means of aſcertaining whether they poſſeſs a nervous ſyſtem.

Organs of Senſe.—The eye.

The cephalopodous molluſca have two eyes ſituated at the ſides of the head, under the tentaculated arms. Moſt of the gaſteropoda have alſo two eyes, but very ſmall, and placed either on a level with the head, or on ſome of the fleſhy and moveable tentacula. In ſome they are ſituated at the baſe of theſe tentacula; in others at the middle, or the point. In all this order, only the clio, ſcyllea, and lernea, want eyes.

No eyes are found in the acephalous molluſca.

Among the articulated worms there are ſometimes found ſmall tubercles, which have been regarded as ſimple eyes, in conſequence of their reſemblance to thoſe of inſects. Some leeches have two, four, ſix, or eight: in ſome of the nereids we find two or four: in ſome naiades only two, &c. No parts that can be compared to eyes have hitherto been obſerved in any zoophyte.

The cephalopodous molluſca, particularly the calmar, have very large eyes; on the contrary, in ſuch of the gaſteropoda as poſſeſs eyes, they are ſcarcely viſible.

The eye of the cuttle-fiſh has no cornea, nor aqueous humour: the anterior aperture of the ſclerotic is not filled up, and the cryſtalline projects acroſs it. Under the conjunctiva, however, a particular membrane is obſerved, dry, fine, and tranſparent, enveloping the ſclerotica itſelf, and ſupplying, by its anterior part, the place of the cornea. This conjunctiva is eaſily ſeparable from the eye, as in ſerpents. The cryſtalline is ſpherical, as in animals which ſee in water; and hard in conſiſtence. The ſtructure of the ſclerotic is ſingular, being much removed poſteriorly from the globe of the eye. The large ganglion of the optic nerve, and ſeveral other glandular parts, are ſituated between them. The ſclerotica, therefore, forms poſteriorly a truncated cone, the pointed part of which is directed to the bottom of the orbit: to this portion the muſcles are attached. The anterior part nearly ſhuts the globe of the eye. It is very ſoft and viſcous; eaſily ſeparated, and preſents a coarſe feltlike texture, which becomes firmer in ſpirits of wine. In ſome ſpecies it has a metallic brilliancy. As there is no cornea, the ſclerotic is wanting oppoſite to the cryſtalline; but the hole is not ſufficiently large to admit a view of the iris without diſſection.

The internal ſurface of the choroid is of a purple-red colour. The uſe of the ciliary proceſſes, in retaining the cryſtalline,

cryſtalline, is no where ſo diſtinctly ſeen as in the eye of the cuttle-fiſh. They form a large zone or diaphragm, in the aperture of which the cryſtalline is truly encaſed. A deep circular furrow paſſes completely round the cryſtalline, and divides it into two unequal hemiſpheres. The ciliary proceſſes penetrate into this furrow, where they are ſo firmly fixed, that they cannot be removed without being torn. The proceſs is not formed of projecting laminæ, but of a continued membrane, the two ſurfaces of which are marked by a circle, conſiſting of a vaſt number of fine radiated ſtriæ, which preſent a very agreeable ſpectacle.

The ſepiæ have glandular bodies between the ſclerotica and the choroid; but none between the latter and the tunica Ruyſchiana. The ſeparation of theſe two membranes is even ſometimes difficult; the choroides is more thick, ſoft, and vaſcular, the Ruyſchiana thin and dry. There is no tapetum, all the eye being lined internally by a deep purple pigment. The pupil is ſhaped like a kidney.

After the numerous optic filaments have perforated the choroid, they are confounded in a ſingle membrane, the retina.

The cryſtalline divides eaſily into two hemiſpheres, the limits of which are marked externally by a deep furrow: each hemiſphere conſiſts of a number of concentric cups, compoſed of radiated fibres.

As the conical ſclerotic of the ſepiæ is attached to the bottom of the orbit, the glandular bodies, which ſerve to ſupport the globe, are ſituated, not between it and the orbit, but between it and the choroid. The part fixed to the edge of the optic hole is pointed; it preſerves therefore ſome degree of mobility. There are only two ſmall muſcles, one ſuperior and an anterior, the head being ſuppoſed upwards.

The ſepiæ and other molluſca, which have not the eyes at the extremity of their tentacula, have no eye-lid; the ſkin covers the eye, as in ſerpents and eels. But the ſlugs, ſnails, &c. have an organization, which is far more complicated, and much better calculated for the protection of their eye. This organ is ſituated at the extremity of a fleſhy tube, called a horn or tentaculum, which may be drawn completely within the head, and protruded by a motion ſimilar to the evolution of the finger of a glove. We have already deſcribed the muſcles that draw the ſnail into its ſhell. The particular muſcle of the eye is attached at the external edge of each of theſe muſcles: this muſcle penetrates to the inſide of the horn, to the extremity of which it is fixed. When it contracts, therefore, but ſtill more when aſſiſted by the contraction of the great muſcle of the body, it draws the extremity of the horn inwardly, in a manner which reſembles the turning in of a ſtocking. The annular fibres, which encircle the horn throughout the whole of its length, unfold the internal part by ſucceſſive contractions, and thus bring back the eye to its external poſition. In the ſlug, the retractors of the eyes are ſimply attached to the fleſhy maſs which forms the foot. In the inferior horns or tentacula, which have no eyes, the mechaniſm is alſo the ſame.

The gaſteropodous molluſca are the only order, among the animals we are now conſidering, that poſſeſſes an organ of hearing. No animals placed below theſe in the ſcale of being are known to poſſeſs ſuch an organ, although there are proofs of the faculty in many. The ear of the ſepiæ is very ſimple; it is entirely concealed in the body of the annular cartilage, which ſerves as the baſe of the great tentacula, or feet of theſe animals. Towards the back of the head there is an eminence of the cartilaginous ring, unperforated, and covered by the thick integument of the animal. The membrane of the labyrinth contained in this part is a ſimple purſe of an oval or roundiſh form, containing a clear fluid. In the common cuttle-fiſh (ſepia officinalis), it has internally ſeveral conical eminences, diſpoſed in an irregular manner: theſe eminences are wanting in the other ſpecies. In the pulp which fills the membrane there is a ſmall body ſuſpended, which is oſſeous in the cuttle-fiſh properly ſo called, and like ſtarch in the octopus. In the ſepia officinalis it reſembles a ſmall ſhell. See Scarpa de Auditu et Olfactu.

Organ of Touch.—We do not eaſily diſtinguiſh all the parts which compoſe the integuments of vertebral animals, in thoſe that have no vertebræ: ſome of the ſtrata are more diſtinct, others leſs ſo: there are alſo ſome ſpecies in which we do not find the whole of them. Of the animals we are now conſidering, different orders dwell in different ſituations, and are expoſed to very different external circumſtances: there are correſponding variations in their outward coverings. Some live in the inteſtines of other animals, the mucous fluids of which ſufficiently protect them; others are encloſed in calcareous or ſtony habitations, neceſſary to enſure them from the agitations of the waves, and from the ſurrounding hard bodies. Others have a hard integument, covered ſometimes with ſpines.

There is an epidermis in invertebral animals: thoſe which live in water have it commonly mucous; it is of a very different thickneſs in the ſeveral ſpecies. It is nearly the ſame in the cephalopoda as in fiſhes. In the naked gaſteropoda it very much reſembles that of ſalamanders and frogs.

There is an epidermis on the ſhells of moſt teſtacea. In the land kind, as the ſnails, it is a dry pellicle, very eaſily detached, when the ſhell is, after the death of the animal, expoſed to the action of the atmoſphere, or plunged into boiling water. In the muſcles, both of freſh and ſalt water, and in other bivalves, we obſerve a ſimilar epidermis, which envelopes the ſhell externally. This epidermis is always wanting on the ſurface of the projecting parts, on which the animal draws its ſhell along the ſand, becauſe it is there worn off. In ſome ſpecies of ſhells, the epidermis is thick and viſcous, and on this account it has been named ſea-cloth. This is very remarkable in ſeveral ſpecies of the genus arca of Linnæus; and to expreſs this peculiarity, he has called one of them piloſa.

In all the teſtacea, the epidermis which envelopes the ſhell is continued to produce the pellicle, which covers the animal, and it produces the ſame change as that which is prolonged within the body of vertebral animals. It is thin and mucous on all the parts which are not expoſed to the action of the ambient fluid. In the ſpecies of gaſteropoda, however, whoſe ſhell is concealed under the ſkin, and does not ſerve for defence, the epidermis does not change its nature. We have examples of this in ſome ſpecies of aplyſia and ſcyllea, as well as in the animal which produces the ſhell, called by Linnæus helix halyotoidea (ſigaret of Lamarck).

Worms have a diſtinct cuticle, which is eaſily ſeparated from the ſkin in the earth-worm, when it has been immerſed for a few hours in ſpirits of wine, or macerated ſome days in water: it is a pretty ſolid pellicle, which may be removed in a ſingle piece. In the ſipunculus ſaccatus this epidermis is even entirely ſeparated from the body, which is unconnected and floating within it, as if it were incloſed in a ſac. Leeches and ſome other worms have the cuticle mucous, like that of the gaſteropodous molluſca.

It is very difficult to aſcertain the nature of the epidermis in zoophytes, or even to diſcover whether it exiſts in ſome of them. The ſea-ſtars (aſterias), the urchins (echinus), and the actiniæ, appear to poſſeſs it. The meduſæ are covered with a pellicle, but ſo thin and tranſparent that it cannot be ſuppoſed to conſiſt of ſtrata. The other zoophytes,

phytes, as the polypes, &c. have a mucous ſurface, the ſoftneſs of which prevents us from diſtinguiſhing any membrane.

Moſt mollufca have a rete mucoſum below the epidermis. In the cephalopoda it is moſt commonly of a blue or red colour; but it forms a very thin layer. That of the gaſteropoda varies conſiderably, as we may obſerve particularly in the ſlug. It is thick and viſcous; but diſſolves completely in water. In ſituation, the ſhell is analogous to rete mucoſum. It is found immediately under the epidermis, and, when ſome of the calcareous part is removed, it is a kind of cruſt without any apparent organization, and not a membrane. It is produced by ſucceſſive ſtrata. Finally, it is coloured, and its ſhades are infinitely various.

The rete mucoſum is to be found in a ſmall number only of zoophytes: and it cannot even be ſeparated from the ſkin, as in the aſteriæ and actiniæ.

It appears to be confounded with the calcareous ſhell, which forms the habitation of ſeveral other genera. This may be obſerved in ſome ſpecies of echini and corallines; and in the ceratophytes, and a number of lithophytes.

Nothing at all approaching to the appearance of nervous papillæ can be ſeen in white-blooded animals. In the cephalopodous molluſca ſome nervous filaments may be ſeen in the ſmall globules, which ſeem glandular, and which cover the ſkin. In other molluſca, ſome nervous filaments may be traced into the ſubſtance of the ſkin; but they cannot be ſeen to form papillæ.

No real cutis is to be obſerved in the invertebral animals, excepting the cuttle-fiſh and the other cephalopoda. It is applied almoſt immediately to the muſcles, by means of a very denſe cellular ſubſtance: it is of a very coriaceous nature, and not eaſily lacerated. Its fibres are very ſlender.

In the other invertebral animals, there is no part which can be compared to the cutis. There is, indeed, a pellicle under the ſhell of the cruſtacea, but it is fine, tranſparent, and has very little conſiſtence. The ſkin caſt off by the larvæ of inſects in moulting, is of the ſame nature and thickneſs as that below it, and which is deſtined to ſucceed it. Even the envelop of certain chryſalides, as thoſe of the lepidoptera and diptera, cannot be regarded as cutis: it is rather a kind of horny epidermis. In the perfect ſtate, there is no part of the teguments of inſects that can be compared to the cutis. The ſame obſervation applies to the worms and zoophytes.

In the invertebral animals, that have ſoft bodies, almoſt all the muſcles may be conſidered as cutaneous; for the greater number are attached to the ſkin. But as they are alſo employed in progreſſion, they are deſcribed among the organs of motion.

Beſides the ſkin in general, which is an univerſal organ of touch in man, and the red-blooded claſſes, there are particular organs poſſeſſing a much more acute power of diſcerning the tangible properties of bodies, and at the ſame time ſo conſtructed as to admit of eaſier application to their ſurface. The fingers exemplify this. It may be doubted whether the invertebral claſſes have any parts calculated to perform ſuch an office; and we rather think that they have not. Some, however, regard the tentacula as organs of touch, and conſider them analogous to the antennæ of inſects, or to the fingers of man and the quadrumana.

We have already deſcribed the tentacula of the cephalopodous molluſca, under the head of *Organs of Motion.* They obviouſly ſerve for ſeizing their prey; but whether they enjoy any ſenſe of touch is extremely doubtful.

The horns of the ſnail have been deſcribed in the account of the eye. Thoſe of the other genera among the gaſteropoda do not differ, except that they are incapable of that motion by which the former are retracted and protruded like the finger of a glove. They have muſcular fibres, which may be contracted or relaxed.

Tentacula are found in many invertebral animals; but they are not ſo univerſal as the antennæ among inſects. They are ſituated on the head; often at the opening of the mouth, as in the doris; above it, as in the ſlug; or round it, as in the terebella. Several ſpecies have ſimilar appendices round the cloak. Such are the limpets, the genus halyotis, &c. Among the acephala, the greater part are provided with theſe appendices, and ſome have them in great numbers. In the ſpecies which have the cloak completely open they are placed around it, and particularly towards the anus: this may be obſerved in oyſters, muſcles, &c. In thoſe in which the cloak opens by a tube only, the appendices are attached to the circumference of its orifice. Such are the genera venus, cardium, &c. The tube itſelf furniſhes theſe animals with an excellent inſtrument of touch. The fleſhy and ciliated arms of the genera lingula and terebratula are equally proper for this employment; but thoſe of the anatifa are very inferior, in conſequence of their horny ſubſtance.

Cirri are found in ſeveral ſpecies of worms; and they ſometimes appear to be formed of different articulations, like the antennæ of inſects. Nerves proceed into thoſe of the aphrodita and nereis. There are none in the lumbricus and leech; but their place is ſupplied in the latter by the two diſks which terminate their bodies. Their number varies: generally there are two, the ſlug has four, the cuttle-fiſh eight, the pennatula forty to ſixty or more. Many varieties of form are alſo obſerved, and deſcribed by writers in natural hiſtory. The tentacula of the polypes are ſaid to be hollow, and to communicate with the ſtomach. Fine hairs are obſerved in them, by means of the microſcope; they alſo poſſeſs numerous knots, which probably are of ſervice in fixing them on animals which they ſeize for prey.

Throughout the invertebral claſſes, we find theſe inſtruments chiefly uſed for ſeizing the creatures on which the animal lives. The tubularia, hydra, brachyonus, vorticella, &c. throw the water into motion by means of their arms. When any thing on which they can prey comes near, they inſtantly ſeize and convey it to the mouth. Trembley obſerved, that the tubularia ſultana (polypes à bouquet) gave a rotatory motion to the water, and thus conducted the prey to their arms. Olivi obſerved, that the actiniæ and polypes (hydra) perceived their prey at a diſtance, put the water in motion, and thus brought it within the ſphere of their arms.

Speaking of theſe organs, Cuvier ſays, "the anus, the tufts and the flowers of ſeveral zoophytes (polypi, Lamarck); the innumerable tentacula of the ſea-ſtars, urchins and actiniæ, and the complicated branches of the meduſæ, are excellent organs of touch."

Of the inſenſible parts, covering the ſkin, very little remains to be ſaid; we have already deſcribed the formation of the ſhell, and have made ſome further remarks on it in ſpeaking of the ſkin.

Many of the vermes claſs have the body furniſhed with bunches of hairs, which are ſometimes ſtiff and retractile, and ſerve for feet, as we have pointed out in the genera nereis, terebella, lumbricus, &c. In the aphrodita, there are, beſides theſe briſtles employed in progreſſion, an infinite number of other hairs, which are long, flexible, and of a changeable ſea-green colour; there is alſo a tomentous felt-like ſubſtance, covering the branchiæ, through which the water is ſtrained.

Organ of Smelling.—The faculty of ſmell is connected in all

all animals, in which it has been hitherto discovered, with the respiratory apparatus; the air which enters the latter loaded with odorous effluvia acting on the olfactory nerves in its passage. This analogy would lead us to look for the nose in similar situations in invertebral animals. No such organ, however, has yet been discovered in this great division of the animal kingdom; although in some instances there are strong proofs that such a sense exists. (See INSECTS, in *Anatomy*.) In mollusca and worms we have still fewer direct arguments for the existence of the sense, than in insects. We should not perhaps expect it in intestinal worms, as it could answer no purpose; nor in such testaceous animals and corals, &c. as have no power of locomotion.

Organ of Taste.—The sepiæ, snails, and most gasteropodous mollusca, have a cartilaginous tongue, the singular structure of which will be spoken of in describing the organs of mastication, &c. It has no motions except such as are connected with deglutition. Its anterior part is fixed below the mouth; and it is incapable of embracing sapid bodies. The acephalous mollusca do not appear to have any tongue; perhaps they exercise the sense of taste by those tentacula, so similar to papillæ, with which their cloaks are furnished at the parts, where the water, which is the vehicle of their aliments, enters.

There is no tongue, properly speaking, in worms; though some have given that name to the proboscis of the thalassema, echinorhynchus, &c. The zoophytes have also no tongue; but the tentacula, which surround their mouth, are frequently so fine, and of so delicate a substance, as to be very well calculated for the seat of taste.

Organs of Digestion.

Organs of Mastication in the Mollusca.—As this class hardly possesses in any instance an osseous or at all solid head, their jaws, when they have any, cannot be articulated with, or rest upon the head. Although the cephalopoda possess a kind of cranium, they do not constitute an exception to this rule; the parts composing their mouth are suspended in the ring formed by this cranium.

The jaws of the mollusca consist of horny, or sometimes stony substance, fixed in an oval fleshy mass, enveloping the mouth, and composed of the muscles of the jaws, and of those concerned in deglutition. The muscular fibres belonging to this mass are not very distinct, although we perceive in them different directions, by which they are calculated to approximate or separate the jaws. The latter differ considerably in form. All the cephalopoda possess two, which resemble exactly the horny mandibles of a bird. They are convex, hooked, and very sharp-pointed. They consist of a double plate of a thick hard horn, of a deep-brown colour, of which the edges, opposed to each other at the triturating part, become very thin, while they are hidden at their basis in the fleshy mass already mentioned. This instrument is employed to break the crabs and other testaceous animals which are used for food.

The form and number of the jaws are not so constant in the gasteropoda. The common slugs and snails have only one, which corresponds to the upper; it is crescent-shaped, and the concave edge is denticulated.

In the tritonia, the jaws may be best compared to the shears employed in shearing sheep. Instead, however, of playing on a common spring, the two plates move by a joint; and they are slightly curved, instead of being plane. These jaws are lateral, and move from right to left; the cutting-edge of one slides over that of the other, and they are very sharp.

We see nothing in the aplysia but a thin horny plate, of no great strength, covering the interior of each side of the mouth. Even this slight induration is not observed in the onchidium.

The gasteropodous mollusca, possessing a long or short proboscis, have no jaws at all; this is the case with the buccinum, murex, voluta, bullæa, &c.; and among the naked gasteropoda, with the doris, scyllæa, &c. We merely find in some cases, that the sides of the bottom of the proboscis are covered with cartilaginous plates; there are such in the doris. The oscabrio has no masticating organ: neither have the pteropoda, as the hyalæa, clio, pneumodermon, &c.

None of the acephalous mollusca have jaws, nor any thing subservient to mastication properly so called. The teredos employ, for piercing wood, the valves of their shells, which some naturalists have called their teeth; but about the true nature of which it is impossible to doubt, when the teredo is compared to the pholas, the genus most analogous to it. The valves of the former seem merely a miniature representation of those belonging to the latter; as Adanson observed long ago.

The naked acephala, as the salpa (biphore), ascidia, &c. have no apparatus for dividing their food. The cirropoda, as the balanus and lepas, have vestiges of jaws, disposed in pairs. The lepas, for example, has two denticulated pairs, and a thin one simply rounded.

Organs of Mastication in the Vermes.—Some of this class have lateral jaws as strong as those of any insect or crustaceous animal, and even very similar to them in form. In a large species of nereis, for example, the opening of the œsophagus is furnished with eight calcareous pieces, which seem to supply the place of mandibles, jaws, and lower lip. The two upper are flattened, arched, and pointed hooks, disposed like the branches of a pair of forceps, united behind, and articulated upon a horny, elastic, semilunar plate situated above the œsophagus. The two following are broader, but not so long; they have six denticuli directed backwards; they are articulated towards the posterior third and below the hooks, which rest upon them in their whole length. The third jaw on each side is placed below and exteriorly; it is shorter and embraces the first jaws, as in the bowl of a spoon. It is found, on attentive examination, to be composed of three small pieces placed near together; the internal has its edge denticulated with twelve small triangular points, like the teeth of a saw: the middle is placed forwards, and forms the posterior edge of a prominent rounded eminence, situated at the opening of the mouth; the last is external, and terminated by a single point. The two lower pieces, which seem to serve for a lower lip, are the longest, flattened horizontally, softer at their edge, which consists of a horny and rather flexible substance. All the parts just specified are surrounded by a stratum of muscular fibres destined to move them.

In other small species of nereis, the opening of the œsophagus is very muscular, covered with wrinkles and points of a horny firm texture, arranged in a circular manner, and on several lines, which are capable of rubbing on each other. Two principal rugæ, situated towards the upper part, support two larger horny pieces of a round form. At the lower and back part are two arched hooks, which come together like the branches of forceps. In other species we also observe two hooks; but the horny points are not arranged in the same manner. They are collected in six groups in muscular eminences, of which three are anterior and three posterior. It appears that the animal has the power of inverting this part of the œsophagus,

gus, so as to bring out the two hooks, which seize the food like a pair of forceps. When it is seized, they drag it in, and the muscular part of the œsophagus, acting on it by its contractions, and by means of the horny papillæ, divides and triturates it, and thus prepares it for the action of the intestinal canal.

The other marine vermes, arranged near the nereids, such as the arenicolæ, the amphinomiæ, amphitrite, terebellæ, and serpulæ, have neither jaws nor teeth. At least we can hardly give that name to the pectinated processes of the amphitrite. They are scaly pointed pieces, of a brilliant golden colour, arranged in two rows, which represent two combs, but situated out of the mouth, on the surface of the head, and enabling the animal to fix itself, or to hook in various substances, but not to masticate or divide the food.

The aphroditæ have four small teeth at the bottom of a proboscis, which they can extend or withdraw at will.

Leeches have three small semi-circular prominences in the interior of the mouth: the edge is cutting, and finely denticulated, like a saw. With this instrument they pierce the skin. The lumbricus has no jaws.

Organs of Mastication in the Echino-dermata.—Amongst the invertebral animals, the echini are those which have the most surprising apparatus of this kind. Their external covering, which is bony and consists of a single piece, presents a large round hole, in which the mass of the mouth is suspended, attached indeed by ligaments and muscles, but moveable to a certain point. The bony part of this mass has some resemblance to a lantern with six divisions: the comparison was made as long ago as the time of Aristotle. The object of the apparatus is to support and move five teeth, which encircle the small round aperture, by which the food enters. These teeth are worn away by mastication, and are constructed on the same principle as the incisors of the rodentia; *viz.* very long, soft behind, and hardening towards the front, in which direction they advance in proportion to the effect of the attrition. They rest in an apparatus consisting of fixed and moveable pieces. The fixed pieces adhere within the shell, all round the hole: they consist of five bony arches, whose convexities are turned towards the cavity of the shell, or downwards; while their concavities are towards the edge of the circular opening, or upwards. The principal moveable pieces are five triangular pyramids, forming the principal body of the mass of the mouth, and dividing the great pyramid or pentagonal lantern of the mouth. Two faces of each pyramid correspond to those of the neighbouring pyramids: they are marked by five transverse striæ. Their inner edges do not touch each other, but are separated by a small interval. The dorsal or external face of each pyramid is convex, thick, and perforated towards its base by a triangular or circular opening, differing in size according to the species. Its inner edge has a groove, in which the body of the teeth passes and can move longitudinally, but in no other direction. Its extremity passes out at the point of the pyramid; and the five points being approximated about the opening of the mouth, the five teeth end there also.

The pyramids are hollow, and their faces do not exactly touch those of the neighbouring pyramids; but they are united by a fleshy mass, which can approximate them. Its effect is that of bringing the five teeth together, and thus contracting the opening of the mouth.

The canal of the œsophagus passes between the five pyramids: the sides of their bases, by which they touch each other, are united, two by two, by five bony pieces disposed like radii, and approximating towards the œsophagus as their centre. Each of these pieces unites the adjacent sides of the bases of two pyramids, being articulated to them in a loose manner. The third side of the basis of each pyramid, that which constitutes the basis of its dorsal or external surface, forms one of the planes of the general pyramid or pentagon. In the natural position these sides correspond to the intervals of the fixed bony arches, which consequently answer to the angles of the pentagonal pyramid.

Twenty muscles act from the fixed bony arches on this pentagonal pyramid, and can either move it entirely, or move on each other the five triangular pyramids which compose it. Ten of these muscles pass from the intervals of the arches to the external bases of the five pyramids. When they act all together, while at the same time the muscles joining the pyramids together contract, the whole mass of the mouth is carried forwards, or towards the outside of the body. If they act separately, they incline the mass and render its axis oblique, making the internal extremity of the axis converge towards the side of the muscles which act. If one acts alone, while the particular muscles joining its pyramid to the two neighbouring ones are relaxed, it carries the tooth of that pyramid further inwards than the others.

The ten other muscles go from the convexities of the arches like radii, to terminate at the points of the pyramids; so that each point receives the muscles of the two neighbouring arches. As the arches project inwardly, these muscles are inclined towards the outer surface of the shell; consequently their effect, when they act together, is that of making the mass of the mouth pass a little inwards. When they act separately, while the muscles uniting the pyramids are contracted, they incline the mass of the mouth, by making the external extremity of its axis converge towards the side of the muscle which acts. When the muscles joining the pyramid to its neighbours are relaxed, the effect of the muscles we are now describing is to draw back the tooth corresponding to that pyramid, and move it away from the aperture of the mouth. Thus, in these three relations, the muscles coming from the arches are antagonists of those which come from their intervals.

If both sets act together, they become common antagonists of those which join the pyramids, and their operation will then be to separate the latter from each other, and to enlarge, not only the entrance of the mouth, but the whole of the passage left for the œsophagus through the axis of the great pentagonal pyramid.

Besides the twenty-five muscles, which act immediately on the pentagonal pyramid and its parts, there are ten others, which act on it through the intervention of five officula, which we must now describe. They are slender, and rather semi-circular or arched; and are placed each on the same level with one of the five bony radii which have been described.

One extremity of each arc is articulated to the internal extremity of the corresponding radiated piece: the other passes above and on the outside of its external extremity, and is bifurcated like the letter Y. A pentagonal membrane unites and strengthens their extremities towards the centre. Each of the two branches of the Y receives a muscle coming from the middle of the nearest interval of the fixed bony arches; so that each of the five intervals gives a muscle to the two nearest Y s.

The effect of the muscles, acting by such levers, in inclining the mass of the mouth in every direction can be easily conceived.

Each tooth may be considered as a long triangular prism; of which the two posterior faces make re-entrant angles. The part which comes out of the point of the pyramid is

very hard; but it becomes gradually softer behind, and forms a long flexible tail. This soft part has a silky, or even metallic lustre, and is torn by the slightest effort.

The form of teeth just described, is that which we find in the echinus esculentus. In other species, as the echinus cidaris, instead of being prismatic, they are like half tubes, and their extremity, which is worn away obliquely, forms the bowl of the spoon.

All the echini, properly so called, and apparently all the subgenera, which have the body spherical and the mouth central, have a mouth constructed in the manner just described. Such as have the mouth central, and the body flattened (clypeaster, Lamarck; echinus rosaceus), have an oval mass composed of five osseous pieces, each supporting a tooth: but this mass is quite flattened, like a circular cake divided into five sectors. The faces, by which the sectors touch each other, are not striated. Although there are fibres to unite them, they are merely perforated by fine and regular pores. The surface opposite to the opening is elevated at the sides into fine and prominent laminæ; the other surface is sometimes like this. Their teeth do not slide in grooves, but are fixed, and have the shape of a compressed cylinder, worn obliquely at the end which is in action. The opposite end is soft, as in the preceding instance, but not prolonged into a flexible tail. The external muscles which act on this apparatus are very trifling.

Such echini as have the mouth oblique, and furnished with a plate of the shell advancing under it, as the spatanguis and cassidula of Lamarck, have neither teeth nor osseous mass to support them. There is merely round the opening of the mouth a skin furnished with small scaly pieces, similar to those of the shell, but not so closely set as to render this part inflexible; it can, on the contrary, be extended and retracted to a certain point, at the will of the animal, like a proboscis.

The asteriæ have no teeth: their mouth is a round membranous aperture, leading to the stomach by a very short œsophagus, which is sometimes capable of being everted, particularly when the animal is hungry. Those spines of the external surface, which are nearest to the mouth, may serve, when inclined towards that opening, to retain the prey: but they cannot be regarded as teeth in the proper sense of the word.

The opening of the mouth in the holothuriæ is surrounded by a ring composed of ten semi-osseous pieces; but they serve merely as points of support for the longitudinal muscles of the body and the tentacula. They are covered by the internal integument of the mouth, support no teeth, and are not concerned in the business of mastication.

The sipunculi have no hard parts in the mouth, nor elsewhere: neither have any of the zoophytes, which come next in the scale.

Salivary Organs.

In the Mollusca.—They are very large in the cephalopoda and gasteropoda; more considerable indeed than in any other animals. In the former there are two pairs. The first and smallest is situated on the fleshy mass of the mouth: each gland has a short excretory duct, penetrating the mass laterally, a little in front of the origin of the œsophagus. The other pair is much larger, situated under the neck, behind the liver, and opposite the cross. The excretory ducts of the two glands unite into one tube, which ascends behind the œsophagus, and penetrates the mass of the mouth towards the posterior point of the small cartilage, which supplies the place of a tongue. These glands are whitish, flattened, and but little granulated. They are lobulated, and have an angular outline; and they receive large branches from the principal artery.

In general, the gasteropoda have only a single pair of these glands. In the common snail (helix pomatia), they are oblong, placed close to the origin of the œsophagus, and produce two long canals, which increase in size as they are inserted in the mass of the mouth above. In the red slug they are less, and merely form a collar round the origin of the stomach.

In the aplysia, the salivary glands are two long, narrow, ribbon-like bodies, floating at the sides of the œsophagus. They are inserted in the mouth, near the origin of the stomach, without having any part of their excretory duct uncovered. Their posterior extremity is fixed to the second stomach by means of branches received from the stomachic artery.

The doris has salivary glands shaped like a long narrow ribbon, attached behind to the stomach. They are so slender in some species, that they might be taken for nerves, when they have passed through the nervous collar of the brain.

Animals of the genus bullæa, though very similar to the aplysiæ, have merely two short slender glands; but in the clio borealis they are nearly the same as in the aplysia.

In the pneumodermon they are elongated, and contracted where they pass under the brain: for in all these animals, without exception, either the gland, or at least its excretory canal, passes with the œsophagus through the cerebral ring.

In the tritonia they are very large and lobulated, situated at the sides of the œsophagus, and tolerably wide in their middle. The structure is similar in the onchidium. They are generally considerable in the aquatic univalves, as in the genera bulimus, murex, and buccinum, which is remarkable, inasmuch as in aquatic vertebral animals they are either small or entirely deficient. They are small in the halyotis.

In the Echino-dermata.—The holothuriæ have all round their mouth oblong blind pouches, which terminate in that cavity, and must be supposed to pour into it some liquor analogous to saliva. There are twenty of different lengths in the holothuria tremula. The pentactes has only two, much larger. Nothing of the kind has been discovered in the echini and asteriæ.

The medusæ and other radiaria, and the zoophytes properly so called, exhibit no salivary apparatus.

Organs of Deglutition.

In the Mollusca.—We must distinguish the external organs or lips from the internal or tongue. The former are again divided into two kinds; *viz.* short or proper lips, and tubular lips elongated into a proboscis.

1. Proper lips. In the cephalopoda, the opening of the mouth is surrounded by a fleshy and denticulated circle, which covers and entirely conceals, when the animal chooses, the two mandibles of the bill.

In the gasteropoda, which have no proboscis, the mouth is generally a longitudinal slit, whose fleshy margins hold the place of lips. Sometimes, as in the tritonia and onchidium, these lips have the form of thin plates, often divided into shreds, as in the tritonia arborescens; the inferior tentacula of the aplysia may also be considered as folds of its lips.

All the common bivalves have round their mouth four membranous folds, usually triangular, and more or less elongated, serving apparently by their motion to convey the food towards the mouth. One of their surfaces is, moreover, so vascular, that it probably has some connection with the business of respiration. Sometimes these folds are united, two by two, in part of their length, as in the pinna. In

other

other inſtances, the proper opening of the mouth is ſurrounded by a circle of fleſhy fimbriæ, more or leſs divided, as in the ſpondylus.

The naked acephala, as the biphoræ, thaliæ, aſcidiæ, &c. have neither folds nor fringes. The mouth of the biphoræ has merely a circular and fleſhy edge.

In the brachiopoda (terebratulæ and lingulæ) lips do not exiſt; but their place is advantageouſly ſupplied by two long ciliated arms.

2. Proboſcis. Several naked molluſca, as the doris, and probably moſt of the teſtacea, as the buccinum, murex, voluta, &c. have a fleſhy cylindrical or conical proboſcis, which they employ for ſeizing their food at a diſtance. The motions of this inſtrument are not confined to flexion and a limited elongation, as in the trunk of the elephant; but it is capable of being withdrawn into the body by folding inwards within itſelf, and of being extended again, like the finger of a glove, the horns of a ſnail, or many other parts of molluſca.

It may be repreſented as a cylinder folded inwards within itſelf, or as two cylinders, of which one includes the other, and the two ſuperior edges are continuous, ſo that in drawing outwards the inner cylinder, it is elongated at the expence of the other, and in puſhing it back again it is ſhortened, while the exterior is elongated. The latter effect takes place at the inſide, becauſe this outer cylinder has its inferior edge fixed to the parietes of the head.

There are ſeveral longitudinal muſcles divided into many ſhreds at their two extremities. They are fixed on one ſide to the parietes of the body; and on the other to the internal parietes of the inner cylinder in its whole length, and to its very end. It is obvious that they will have the effect of drawing inwards this cylinder, and the whole proboſcis. When it is thus retracted, a large part of the inner ſurface of the internal cylinder comes to form part of the outer ſurface of the external cylinder: and the contrary takes place when the proboſcis is elongated or extended. The inſertions of the muſcles undergo correſponding variations.

The elongation of the internal cylinder, by the unfolding of the external, is effected by the proper annular muſcles of the proboſcis. They ſurround its whole length; and by their ſucceſſive contractions thruſt it outwards. There is one ſtronger than the others where the external cylinder is attached to the parietes of the head. When the proboſcis is elongated, its retractor muſcles, by acting partially, can bend it to one ſide or the other; and the various portions in this way antagoniſe each other.

This deſcription may ſerve alſo for the murex tritonis; but the proboſcis is much ſhorter than in the buccinum.

In thoſe molluſca which have a proboſcis, the œſophagus is very long, and looſely folded, that it may follow all the motions of that inſtrument: it forms in a manner a third cylinder concentric to the two others.

None of the cephalopodous, pteropodous, or acephalous claſſes have a proboſcis: the part which has been ſo named in the cirrhopoda (the anatifæ and balani) is the rectum. The ſuppoſed proboſcis which ſome authors ſpeak of in ſeveral bivalves, is the canal for the conveyance of water into the ſhell: it is placed oppoſite to the true mouth, and is an organ of reſpiration, not of deglutition.

The Tongue.—It is very ſingular in the cephalopoda and gaſteropoda; and has nothing parallel in the animal kingdom. It is a membrane covered with prominent ſpines or ridges directed backwards, and capable of exerciſing a kind of periſtaltic motion, in which the ſpines are alternately raiſed and depreſſed, ſo as gradually to propel the alimentary ſubſtances into the œſophagus.

The tongue of the cephalopoda is placed between the two mandibles: it is behind the jaws in ſuch gaſteropoda as have thoſe organs. This is particularly obſervable in the tritonia, when the tongue immediately receives whatever paſſes the cutting edge of the jaws. Others have it near the opening of the mouth; and thoſe which have a proboſcis, have their tongue at the anterior extremity of that organ. In that caſe it ſerves, in ſome degree, as an organ of maſtication; as it can cut the food more or leſs by means of its hooks.

The tongue varies much in length; and there are ſpecies in which we are at a loſs to aſſign an explanation for its conſiderable extent. In the halyotis, for example, it is half as long as the body; in the patella and turbo pica it is nearly quite as long, and folded like the inteſtines; and, what is remarkable, theſe genera have no proboſcis. In thoſe which have one the tongue is ſhort. The arrangement of the organ makes it impoſſible for the animal to employ more than the anterior part: but probably it may reſemble ſome kinds of teeth, the poſterior part coming forwards, and ſucceeding to the other in proportion as it is worn away in front. This conjecture receives confirmation from the ſoft and nearly gelatinous ſtate of the poſterior part: we may ſuppoſe that it becomes firm when it comes into uſe, as the teeth of quadrupeds which are to ſucceed. All this poſterior part is rolled up longitudinally, like a horn.

In the cephalopoda the tongue is oblong, and prolonged poſteriorly into a long horn. In the aplyſia it is very broad, heart-ſhaped, and placed on two rounded eminences ſeparated by a groove. In the bullæa it forms a ſmall tubercle at the bottom of the mouth.

The hard covering of this tongue is diſpoſed in a regular and conſtant manner in each ſpecies. It conſiſts, in the cephalopoda, of hooked ſpines of equal length, arranged in two lateral rows, and of a middle ſeries of ſcales with five points.

In the oſcabrio, there is on each ſide a ſeries of hooked ſcales, with three points, and of long, ſharp, and hooked, but ſimple ſpines. In the middle there are ſmall tubercles.

The turbo pica has tranſverſe, cutting, and denticulated laminæ.

The tongue of the aplyſia is covered all over with ſmall hooked ſpines, diſpoſed in the quincunx order. In the onchidium there are very fine tranſverſe grooves, themſelves marked with ſtill finer ſtriæ of an oppoſite direction. The arrangement is nearly the ſame in the doris. A ſimilar ſtructure occurs in the ſnail and ſlug, but it is ſo minute that a ſtrong glaſs is neceſſary to perceive it.

The acephala have no proper tongue; but there is a circular valve at the entrance of their œſophagus, directed towards the ſtomach, and capable of contributing powerfully to deglutition. It is very plain in the oyſter. Generally theſe are mere tranſverſe folds, which direct the food by their periſtaltic motion.

The Alimentary Canal and its Appendages.—The *alimentary canal* of invertebral animals is compoſed of the ſame eſſential parts as in thoſe which have vertebræ. There is an internal mucous ſurface, which in ſome inſtances aſſumes a callous nature, and ſometimes becomes villous, or has a papillary texture; a cellular ſtratum external to this, analogous to what ſome have called the nervous coat of the mammalia; and a muſcular covering of variable thickneſs. A leading difference is, that often the ſerous or meſenteric coat, and the meſentery itſelf, are wanting. There ſeems to be none in ſeveral molluſca, and in the claſs of inſects, and we only meet with it again in the echino-dermata. Another difference is, that the cellular ſtratum is not always vaſcular: it is ſo

only

only in the mollusca, worms, and some echino-dermata. In no case have insects any thing more than tracheæ ramified in the parietes of their intestines, and most zoophytes have nothing at all. A third, but less general difference is, that the membranes of the stomach are often armed with hard parts, either simply in the form of plates, as in the bullæa; or of teeth, as in the crustacea; or of scales, as in the grylli; or hooks, as in the aplysia. This is a new analogy between the intestinal membranes and the skin; for we know, that in these animals, the shells and scales which cover them, are often produced by the induration of their rete mucosum.

In its relative length, in the size of its different parts, in the number and form of its dilatations, and particularly of the stomachs and cæca, and in its internal folds, the alimentary canal of invertebral animals exhibits varieties altogether analogous to those observed in the vertebral classes. Thus, for example, such as are carnivorous, have a simple and short canal, &c.

There is more variety in the position of the anus. The zoophytes, some echino-dermata excepted, have none at all, but void their excrement by the mouth. Insects, worms, and crustacea, always have an anus at the extremity of the body opposite to the mouth, and below. In the mollusca its position seems subject to no rule. In the doris we find it backwards and upwards; backwards and downwards in the onchidium. It is on the right side in the slug, snail, aplysia, and bullæa; in the head, in the patella; in front of the neck, in the cuttle-fish; on the side of the neck, in the clio: in the acephala it is usually found opposite to the mouth.

Alimentary Canal of the Mollusca.—Locomotion is performed in all the *cephalopoda* with the head downwards: as the mouth is in the centre of the feet, the food must ascend into the abdomen: the rectum descends and opens into a cartilaginous cloaca, or funnel, placed in front of the neck, and serving as a common receptacle for the semen, the eggs, and the inky fluid. The œsophagus passes behind the liver, or towards the back; and the rectum in front, or towards the abdomen: the rest of the canal is in the bottom of the sac or abdomen. In the middle of the œsophagus of the sepia octopus, there is a considerable dilatation, of which the parietes, though thin, are manifestly glandular: this is a true crop, analogous to that of birds; but they have nothing similar to the bulbus glandulosus of birds. The stomach is a gizzard in its general arrangement: the parietes are covered by two muscles nearly as strong as those of the gizzard of the gallinaceous birds: its internal membrane is equally thick, cartilaginous, and easily separated. The pylorus is near the cardia, and leads into a species of cæcum, or, if that name should be preferred, a third stomach which is a little bent on itself in a spiral form. Here the hepatic canals terminate. The second, or true pylorus, is near the other, and also near the cardia. A smooth canal lies along the concavity of the third stomach: the rest of its internal surface is plaited transversely, and exhibits the orifices of an infinite number of small mucous follicles. The intestine itself has thin sides: it is large, and nearly of uniform diameter throughout. In the octopus it makes two nearly transverse convolutions, and a large longitudinal turn before it proceeds straight to the infundibulum. In the calmar it goes straight, without any convolution.

The alimentary canal presents numerous varieties in the *gasteropoda.* It is most simple in the snail and slug. The œsophagus, after being a little dilated to form a kind of crop, ends at the stomach, which is itself merely an oblong membranons bag, with a large hepatic canal opening in it. The pylorus is near the same part: the intestine is cylindrical, and of uniform size; it makes two turns, and then goes forwards and to the right, to open close to the orifice of the lung, after having passed along the parietes of that cavity, and furnished numerous branches to the venous vessels which are distributed over those parietes. The same relation is observed in the other gasteropoda between the intestine and the pulmonary organ: hence the anus is always near the branchiæ, when the latter are of limited extent.

The parmacella differs only in having the anus, as well as the pulmonary opening further back; and the testacella, in having them quite at the posterior extremity.

There is a simple membranous stomach in the doris; it is an oval sac, into the bottom of which the bile is poured from numerous orifices. The pylorus is placed forwards, near the cardia; and the intestinal canal, which is large and short, goes directly backwards, almost without any turn, to open in the centre of the branchial circle, placed at the posterior part of the back.

In the tritonia and phyllidia, the stomach is as in the doris; but the intestine goes forwards to the right, where the anus ends under the edge of the cloak. The pylorus is nearer to the cardia, and the anus more anterior, and nearer to the generative orifice, in the phyllidia: it is separate, and placed further back, in the tritonia.

The halyotis has merely a membranous sac at the back of the body. The canal is uniform throughout, and runs twice and a half the length of the body, nearly in three straight lines. It opens by a fleshy tube in the cavity of the branchiæ, on the left of the body.

In the buccinum the œsophagus is long and slender, has a small lateral crop, and soon after ends in a rounded stomach. The intestine is very short. When it has reached the right side of the branchial cavity, it is dilated into a large tube with thick sides, of which the internal surface is plaited longitudinally: it contracts suddenly before opening at the anus.

The stomach of the murex is a slight membranous dilatation. The rectum is not dilated, but situated as in the buccinum. The intestine is short.

The stomach of the patellæ is a scarcely sensible dilatation; the bile enters by numerous pores. In the oscabrio it is a rounded sac. The intestinal canal in both these genera is slender and long; and makes many convolutions.

In the helix stagnalis the stomach begins to be more complicated. It is furnished with two muscles united by common tendons, and radiated exactly as in the gizzard of birds. Immediately before entering it, the œsophagus is dilated into a kind of crop.

The onchidium also has a thick gizzard, preceded by a crop. Two hepatic canals open into the latter, and a third into the former. The gizzard is followed by two membranous but thick stomachs; one is pyramidal, with the broad part turned towards the gizzard, and parietes deeply plaited into longitudinal ridges: the other is narrower, cylindrical, and more delicately plaited.

There is some analogy between the stomach of the pleurobranchus and that of the onchidium; but the organ is weaker in the former. There is at first a membranous crop, which is a mere dilatation of the œsophagus, receiving, close to the opening of the second stomach, the biliary fluid: then comes a small gizzard, with muscular but weak parietes: this is followed by a third stomach, which resembles, by the thin longitudinal laminæ of its inner surface, the third stomach (manyplus, feuillet, Fr.) of the ruminantia. Lastly, there is a fourth stomach, simply membranous like the first, but

but ſmaller. We obſerve in the gizzard a narrow groove, leading directly from the firſt ſtomach into the third, and probably ſubſervient to ſomething like rumination. The inteſtine is ſhort and uniform. The aliment is moulded, in the third ſtomach, into long whitiſh cords.

The aplyſia has a ſtill more curious ſtomach: it is alſo four-fold. The œſophagus, at firſt narrow, dilates ſuddenly to form the firſt ſtomach or crop, which is a large thin membranous bag, making a nearly ſpiral turn, and having no glandular appearance. Then follows a ſhort cylindrical gizzard, with muſcular and very ſtrong parietes: they are covered internally with a very extraordinary kind of armour, to which there is nothing exactly ſimilar, although the oſſeous pieces belonging to the ſtomach of the bullæa bear ſome analogy to it. Let us conceive pyramids with rhomboidal baſes, whoſe irregular faces are united into an apex divided into two or three obtuſe points. Their ſubſtance is ſemi-cartilaginous, and compoſed of ſtrata parallel to the baſis. There are about twelve large ones, arranged in quincunces on three rows, and ſome ſmaller, placed at the upper edge of the gizzard. Theſe pyramids adhere ſo ſlightly to the mucous ſurface, that the ſlighteſt contact diſplaces them, no trace of membrane, or any other union, being perceptible. The places to which they adhered are, however, marked by ſmooth prominent ſurfaces, while the intervals are ſlightly hollowed and ſtriated. The apices of theſe pyramids come together in the middle of the gizzard, and they muſt conſequently comminute the food which paſſes along the ſpace between them. The third ſtomach is broad, but not ſo long as the former, and has an equally ſingular covering, conſiſting of ſmall pointed hooks attached to one ſide of the cavity, almoſt as ſlightly as the pyramids are to the preceding ſtomach. Their points are turned towards the gizzard, and no other uſe can be aſſigned to them but that of ſtopping the paſſage of the aliment when inſufficiently triturated: here, indeed, the form of the alimentary ſubſtances is no longer recognizable. Near the pylorus are two ſmall prominent membranous criſtæ, between which the orifice of the fourth ſtomach is ſeen, and that of the hepatic veſſels. The former, as in the cuttle-fiſh, might be called a cæcum. This cæcum is as long as the third ſtomach: its diameter is ſmall, its ſides ſimple, without any internal projections, and it is abſolutely hid in the liver. The inteſtinal canal is of uniform diameter, with thin tranſparent ſides, more ſo than thoſe of the third ſtomach, and diſtinguiſhed from it by this circumſtance: it makes two great convolutions enveloped in the lobes of the liver, and terminates at the anus, in the middle of the right ſide of the body, by a rectum which paſſes tranſverſely. Its internal ſurface exhibits neither papillæ nor valves; it has no ſenſible conſtriction nor dilatations.

The moſt ſtrongly armed of all known ſtomachs is that of the bulla lignaria and aperta; there are three flat ſtony pieces; two of ſimilar form, triangular, broader and lateral, one narrower, rhomboidal and middle, united by muſcular fibres, which have the power of approximating them. Theſe hard ſubſtances are larger in the bulla lignaria, and rather differently made. Draparnaud found that this apparatus had been conſidered as a ſhell, and had given riſe to the eſtabliſhment of the genus tricla or gioënia.

In the Pteropoda.—Two of the ſmall genera which compoſe this order, *viz.* the clio and pneumodermon, have ſtomachs of the ſame kind: they are ſimple membranous bags, ſurrounded by the liver, and receiving bile from numerous orifices. The third genus, hyalæa, has a dilatation of the œſophagus, followed by a ſhort cylindrical gizzard: both have internal longitudinal plates. The two firſt genera have a ſhort ſtraight inteſtine: the hyalæa has three convolutions included in the liver.

In the Acephala.—We generally find in this family a membranous ſtomach, following a very ſhort œſophagus, ſurrounded on all ſides by the liver, which adheres to it intimately, and in which it appears to be excavated. Its parietes are very irregular, forming ſeveral ſmall cul-de-ſacs, at the bottom of which the bile is received: for in all the order that fluid enters the ſtomach immediately. The biliary apertures have ſomewhat valvular edges, to prevent the food from entering the ducts. The inteſtine makes ſeveral convolutions, chiefly out of the liver, and moſt frequently in the ſubſtance of the muſcles of the foot, in which it is in a manner incaſed. Towards its origin, in ſome ſpecies, the inteſtinal canal has dilatations, which might be taken for ſecond ſtomachs. In others there is a true ſecond ſtomach, which is a kind of cæcum near the pylorus. The greateſt ſingularity, which is alſo abſolutely peculiar to ſome acephala, is a part long ago deſcribed by Willis, Swammerdam, and others, but more particularly by Poli, under the name of the cryſtalline ſtilette. It is probably tranſparent and cartilaginous; elongated, pointed at one end, and obtuſe at the other. It is compoſed of laminæ, included one in the other, and contained in a ſheath cloſely applied to the commencement of the inteſtine, but open towards the ſtomach, ſo as to allow the point of the ſtilette to penetrate that cavity. On this point is articulated a body of ſimilar texture, divided into ſome conical eminences, and occupying the entrance of the ſtomach: it is difficult to aſſign the uſe of ſuch an organ.

The ſolen has a ſecond ſtomach, long and ſlender, and occupying half the length of the foot, into which it penetrates: the inteſtine begins at the ſide of the origin of the latter, and proceeds parallel to it. The oyſter has alſo a ſecond ſtomach, ſituated between the branchiæ and the muſcle that cloſes the ſhell: the inteſtine riſes from it near its commencement, and proceeds in an oppoſite direction.

According to Poli, the inteſtinal canal is ſhorter in the genera fixed to one ſpot, as the oyſter and ſpondylus, than in thoſe which are capable of locomotion, as the cardium and venus. Yet the freſh-water muſcle has it ſhort; it makes a ſingle fold in the foot, and returns backwards to deſcend to the anus. The ſame arrangement is found in the mya pictorum. On leaving the ſecond ſtomach, in the oyſter, the inteſtine aſcends, ſurrounds the liver, and then goes backwards. It is nearly the ſame in the ſpondylus. In the eatable muſcle (mytilus eſculentus), it deſcends along the back, aſcends again, goes round the liver, and then deſcends to the anus. It is very ſhort, making only two ſlight curves, in the venus decuſſata; but in the cardium edule (common cockle) it makes ſeven or eight ſpiral turns in the foot, and is more than five times the length of the body. It is equally long, but rather differently arranged, in the mactra piperata, where its commencement is very large, and might eaſily paſs for a ſecond ſtomach. It is the ſame in ſome of the genus venus, and in the orbicular tellinæ: the common tellinæ have moreover a kind of cæcum at the end of this dilatation.

In moſt of the acephala the rectum paſſes through the middle of the heart, but the oyſter is an exception.

There are ſome remarkable varieties reſpecting the anus. In thoſe which have no tubes to the cloak, and which walk or ſpin like the freſh-water and ſea muſcles, it opens by a fleſhy diſk or ſphincter, between the two edges of the cloak. In thoſe which have theſe tubes, the anus itſelf makes another, ſituated more internally, projecting into the cavity

of

of the cloak, behind one of the mufcles which clofe the fhells. Such is the cafe in the folen, pholas, &c.

The naked acephala have a fimple ftomach and fhort inteftine. In the afcidia, the latter makes only two convolutions; in the biphori (falpa), it turns twice round the liver, near which the anus is found. There is only one fpecies (thalia) in which the canal is prolonged further, even to the oppofite extremity of the body. The heart in this family is never traverfed by the rectum.

The brachiopoda (terebratulæ and lingulæ) have a fimple uniform canal. In the lingula it comes from the mouth, which is between the two arms, and makes two turns before reaching the anus, which is at the fide. It is nearly twice as long as the body.

Alimentary Canal of Worms.—It is in general ftraight, without any confiderable inequalities, extending from one end of the body to the other, and occupying nearly its whole capacity.

In the common fea-moufe (aphrodite aculeata), there is a flefhy part in front, holding the place of a probofcis, and capable of being extended out of the body: a miftake has been committed in confidering this as a ftomach. A cylindrical inteftine follows, of fmall diameter, but giving origin on each fide to twenty long blind proceffes, becoming larger towards their blind end, which is attached between the mufcles of the feet and the lateral veffels. This organization is the more remarkable, as nothing like it is met with in the neighbouring genera.

The amphinomia capillata and tetraedra (terebella flava and roftrata) have firft a flefhy mafs of the mouth or a probofcis, rounder and fhorter than that of the aphrodite, then a fmall œfophagus, and an enormoufly dilated ftomach, with cellular parietes, like thofe of a colon, the folds of which are fixed by a tendinous line placed on the ventral fide. It occupies two-thirds of the length of the body, and ends in a large fhort inteftine.

The arenicola, or worm ufed as a bait by fifhermen (lumbricus marinus, Linn.) has no flefhy probofcis; the œfophagus occupies one-eighth of its length; the ftomach, which is more dilated, occupies a third. It is of a fine yellow, with the furface divided into lozenge-fhaped facculi, the feparations of which are marked by veffels of a beautiful red. The reft of the canal is fmall, fmooth, and ftraight.

In the leech of frefh water (hirudo fanguifuga), an œfophagus equal to one-eighth of the animal is followed by a ftomach occupying one-half of its length: this organ is capacious, with thin fides, and divided by numerous membranous diaphragms, which contract it confiderably, leaving only an opening in the middle. The inteftine is narrower, and its internal membrane, which is opaque, exhibits an infinite number of fmall plaits; it enlarges towards the anus, which is very fmall, fo that its exiftence has been erroneoufly denied by fome anatomifts. Two cæca arife from the pylorus, proceed parallel to the principal canal, and are nearly as long. In the fea-leech (hirudo tuberculata), the alimentary canal may be faid to enlarge from the mouth to the oppofite end; the exiftence of a ftomach is marked merely by its fepta, which are wanting in the inteftine.

The common earth-worm has only a long canal, divided by numerous tranfverfe fepta, which are even ftrengthened by membranes attaching them to the exterior covering of the body. Some dilatations in front may reprefent a kind of ftomach.

The canal of the nereis is equally fimple, ftraight, and conftricted at intervals: nothing more can be obferved in the amphitrite, terebellæ, and ferpulæ. The tail which terminates the body of the genus amphitrite, contains the rectum. Cuvier has, however, obferved in one fpecies of amphitrite, which lives commonly on the oyfters, a very thick and hard globular gizzard.

In the lumbricus, thalaffema, and echinus, the canal is five or fix times longer than the body, of equal diameter throughout, with thin and corrugated fides. The pofterior part is filled with excrement, moulded into fmall fhort cylinders.

Among the inteftinal worms, the afcaris has a very fimple canal with thin fides, of nearly uniform diameter, and fcarcely longer than the body.

Alimentary Canal and Sac of Zoophytes.—In this clafs we meet with alimentary canals poffeffing both mouth and anus, and others like a fimple fac, more or lefs complicated. The firft are even fupported by a true mefentery, which is not found in infects, mollufca, or worms. Such a ftructure is feen in the echinus and holothuria.

The canal of the holothuria tubulofa is four times the length of the body, in which it makes a double convolution, refembling the figure 8. It commences at the mouth by a flight contraction, then retains nearly the fame diameter throughout. Its parietes are flender: the anus opens into the great cloaca fituated at the back of the body, and feparated from the cavity of the abdomen only by a valve: this circumftance will be further confidered in fpeaking of the refpiratory organs. A membranous mefentery attaches this whole canal to the external coverings of the body. A fimilar arrangement is obferved in the holothuria pentactes.

The fipunculus has a fmall uniform canal, going firft ftraight from one extremity of the body to the other; then returning in a fpiral manner round this ftraight part, to terminate at a lateral anus very near the mouth. It is fix or eight times as long as the body.

An alimentary cavity, conftituting a complicated bag, is obferved in the afterias. It is a membranous fac, much folded when empty, placed in the common centre of the rays, and having no other opening but the mouth, fo that the excrement is rejected by the paffage which admits the food. This bag has ten blind appendices or inteftines, minutely fubdivided into branches and ramifications, which form a very beautiful object. Thefe are lodged in the rays or branches of the body, two in each: when there are more than five branches, there are alfo more than ten of the ramified cæca. Thefe trees, or kind of bunches of grapes, are fixed rays in their place by membranous mefenteries.

The afteriæ, whofe rays have no feet, but refemble the tails of ferpents (ophiuri, Lamarck), have no fuch cæca. Their ftomach is a fimple bag, occupying merely the central difk of the animal: its membrane, however, exhibits in all parts an infinite number of fmall facculi. Probably the fame ftructure exifts in the kind called caput medufæ.

The alimentary canal of the medufæ is as complicated as that of the afteriæ; but, inftead of being fufpended in the great cavity of the body, it feems to be excavated in its fubftance. The ftomach, which is very large, fills the bafis of what is called the pedicle or difk of the animal: tubes proceed from it in a radiated manner towards the edges of the fuperior broad part of the body, which has the fhape of a fegment of a fphere. Thefe veffels communicate together by lateral branches, and both furnifh an infinite number of fmall ramifications, which form a very complicated net-work over the whole body, conveying the nutritive fluid to all parts, as blood-veffels do in other animals. This plexus is particularly difcernible towards the edge of the umbella, where it refembles a fpecies of lace.

The

The medusæ differ most widely in the manner by which the aliment enters the stomach. Some have a single mouth, a large round opening: others, instead of a mouth, have numerous branched tentacula, each perforated by a small opening. Each opening gives origin to a small canal, which joins the neighbouring one, and so on: in this way four large trunks are formed, which end in the stomach, and convey to it the matters absorbed by the small apertures of the tentacula. The number of the latter sometimes exceeds eight hundred.

It is from this structure, which is hitherto unique in the animal kingdom, that Cuvier has established the genus rhizostoma, from two Greek words (ῥιζα and στομα) signifying root and mouth. The rhizostoma, in fact, may be said to derive its nourishment from a kind of roots; and in it, as well as in all the medusæ, the stomach supplies the place of a heart.

The alimentary apparatus of the actiniæ consists of a simple bag, with a circular opening, serving both for mouth and anus. The aperture is placed in the centre of the superior surface of the animal, and is surrounded by the tentacula, which can seize the prey, and convey it immediately to the mouth. The animal has the power of contracting or dilating this orifice. The alimentary sac is suspended in the general cavity of the animal by a kind of membranous attachment. No intestine nor any vessel is known to proceed from this stomach. See Memoire pour servir à l'Hist. de l'Asterie rouge, &c. par Dr. Spix, Annales du Muséum, tom. xiii. pl. 33.

"It is surprising (says Reaumur), that a soft animal like this, not provided with claws, or any thing equivalent, should be able to devour others apparently well defended by their shells, such as muscles and other bivalves, and various species of univalves. It is however certain, that the actiniæ live on the flesh of these animals, though, as they swallow them whole, and then contract the entrance of the stomach over them, it is not easy to find out how they extract the animal from its shelly coverings. We can only see that after a certain time they expel the empty shells by the same orifice through which they had swallowed the whole animal. I have seen in this way the largest muscle-shells thrown out empty by moderate-sized actiniæ: while in some cases they are rejected without the animal having been extracted. In the same way I have seen them throw up entire buccina. I once saw a large muscle expelled entire through the basis of the actinia, where there is no natural opening. In getting rid of the shells, particularly when they are large, the animal not only dilates its mouth to the greatest extent, but absolutely inverts the whole cavity, as you would a stocking." See fig. 25. Reaumur, Acad. des Sciences, 1710. p. 475.

In the common polypes (hydra), the whole body appears to be a stomach; and the nutritive matter is imbibed apparently directly from the surface of the cavity into the substance of the animal. The most curious fact in relation to this stomach is, that if the animal be inverted, the external surface performs the office of stomach just as well as the original stomach did.

The pyrosoma, a large species of marine polypus, without arms, brought to France by Péron, seems, like our fresh-water polypes, to be a mere stomach.

The polypes, which form by their aggregation compound animals, such as those which produce the various lithophytes, have a nutritive system nearly related to those of the common polype and medusa. Cuvier has examined this in the veretillæ (pennatula cynomorium), whose large and soft body, and transparent polypes, are more favourable to such researches than most other animals of this class. In the body of each polype, a small stomach with brownish parietes is observed, from which proceed five tubes similar to those of the medusæ, that is, executing the functions both of intestines and vessels. These intestines are at first yellowish and undulated; having traversed two-thirds of the length of the polype, they become straight and smaller, and thus penetrate the general body or stem which supports all the polypes. They then separate to join corresponding vessels from the neighbouring polypi, and form with them a network occupying the whole mass of the stem. By means of this communication, the food taken by one polype is enjoyed by the whole animal, which may be considered as a single one with several mouths and stomachs.

The alcyonium exos exhibits an analogous structure. See Dr. Spix, in the Annales du Muséum, tom. xiii. p. 451, et seq. pl. 33; and it is probable that a similar organization prevails through the whole class.

Appendages to the Alimentary Canal.

Liver.—All the mollusca have a liver, which is generally very large, but never possesses a gall-bladder. It does not receive, as in the vertebral animals, the blood which has circulated through the intestines, and thus acquired a venous nature; but it derives from the aorta the necessary supply for its own nutrition, and the secretion of its peculiar liquor; and it returns this blood to the vena cava, which is the same with the pulmonary artery in these animals. In this arrangement we may perhaps find a reason for their having no spleen.

The liver of the cephalopoda is a large oval mass of a yellowish-brown, situated towards the back near the head, partly filling the interval behind the funnel, and partly descending into the abdomen. It may be divided into two lobes, between which the trunk of the aorta passes, giving to each a considerable branch. The bag, which produces the inky fluid peculiar to these animals, is inclosed between these two lobes; and in the calmar (sepia loligo), it is attached in front of them. Monro considered it to be a gall-bladder; he thought the ink was merely bile, consequently that that fluid was excrementitious in these animals. This is a gross error. In the common cuttle-fish the ink-bag is found in the bottom of the abdomen, far from the liver; and in those species, where the two organs are nearest together, they are not organically united. The bag contains its secreting apparatus in its own cavity, and the liver pours the bile into the alimentary canal. There are two excretory tubes, one for each lobe, penetrating together the third stomach, near its middle. Air impelled into the hepatic vein passes easily into these two canals; and they speedily inflate the third stomach. The bile which they pour out is of an orange-yellow: it remains for a considerable time mixed with the chyme, in the lateral and tortuous reservoir of the third stomach, where it can slowly exert its action.

All the gasteropoda have a large liver, divided into numerous lobes and lobules, and sometimes into several masses, each of which has a particular excretory canal. These lobes are interwoven with the intestinal convolutions, enveloping them, or being enveloped by them, and united by a cellular texture. The distribution of the artery and vein is easily seen, and even that of the proper vessels, which are distributed into the smallest lobules, the liver resembling a bunch of grapes more than a homogeneous parenchymatous mass, and extending usually through nearly the whole length of the body. In the aplysia, it pours out its secretion by several openings near the orifice of the cæcum, or fourth stomach; that is, nearly as in the cephalopoda. In the pleurobranchus and onchidium, which have several stomachs, there are differences. The bile is poured into the first stomach of the pleurobranchus. The onchidium has its

its liver divided into three distinct masses, of which the excretory ducts are not even united. The two first terminate in the first stomach by distinct orifices; the third opens into the bottom of the gizzard or second stomach.

In the testacella the liver is divided into two independent masses: their ducts are inserted opposite each other, in the beginning of the intestine, not in the stomach.

The doris and phyllidia, which have a simple membranous stomach, receive the bile in it by several openings. The liver of the former is remarkable, inasmuch as it gives rise to a second excretory vessel, terminating on the outside of the body, near the anus. The object of this structure is not known.

The snail and slug have enormous livers, divided into many lobes and lobules, all which pour their liquor by a common canal into the bottom of the cul-de-sac formed by the stomach behind the pylorus. The appearance of the liver is remarkable, particularly in the slug, from the contrast of its black surface with the fine opaque white of the blood-vessels. The testaceous gasteropoda have an equally voluminous liver, filling, together with the generative organs, the greatest part of the convolutions of the shell.

The liver of the acephala generally envelopes the stomach, like an incrustation on its surface: it pours the bile into that cavity by numerous orifices. The patella among the gasteropoda, and the clio and pneumodermon among the pteropoda, have the same structure; but the hyala, which belongs also to the latter order, has its liver placed as in the common gasteropoda, that is, interwoven with the intestine.

Even in the acephala, the intestine, after leaving the stomach, often returns to penetrate again the substance of the liver.

This form and disposition of the liver are found in the naked acephala (ascidiæ and biphori), as well as in the others. In the brachiopoda (lingulæ and terebratulæ), the liver is distinct, connected with the convolutions of the intestine, and even with the muscles.

In all the mollusca, as in the red-blooded animals, the bile is of a greenish-yellow, more or less strongly marked.

Nothing analogous to a liver is found in the worms, unless we consider the yellow substance in the parietes of the stomach of the arenicola as such. The echino-dermata and zoophytes have nothing which can be compared to this gland. The liver then seems to end with the mollusca, and some crustacea: insects have a kind of substitute for it, and zoophytes have nothing like it. In proportion as the function of respiration is less confined, and extends to more parts in the body, the liver ceases more completely.

Coverings and Supports of the intestinal Canal.

In the Mollusca.—We may assert in general, that the alimentary canal of the mollusca is not enveloped nor supported by a mesentery. The different convolutions are joined together, and to the lobes of the liver, by cellular tissue, blood-vessels, and nerves, but not fixed to a membrane. Yet all the viscera are contained in a true peritoneum, which even forms a distinct cavity for the heart, and also envelopes the lung, when the latter is not entirely exterior; but this peritoneum is not folded inwards to cover the intestine.

The peritoneum of the gasteropoda nearly lines the whole external integument of the body: the latter is thick and muscular, and, therefore, protects it effectually. In those which have a shell, the part of the body constantly covered by it is not surrounded by muscles; it is covered only by peritoneum and a thin layer of skin, and might almost be regarded as a natural hernia, formed by parts which have protruded from the muscular portion of the animal.

In the cephalopoda the peritoneum is a bag contained in another bag, namely, that which properly constitutes the body. But the latter does not entirely inclose the former; its opening leaves the peritoneum uncovered in front, where it is protected only by a thin continuation of the skin. The peritoneum of the cephalopoda is further remarkable from the circumstance of its being perforated by two openings, which communicate externally. There is no other example of such a structure, except in the rays. As the cephalopoda have a head, separated from the body by a neck, and a true cartilaginous cranium, their peritoneum, which does not reach beyond the neck, does not cover the brain, nor the mass of the mouth, as in the other mollusca.

In consequence of the form of the body, the peritoneum of the acephala occupies a smaller space than that of the other mollusca. It is surrounded by the muscles, which go to the foot; and when there is no foot, it is simply covered by the skin. Nothing like an omentum has been seen in any animal of this class.

Some worms, as the arenicola, have their alimentary canal supported merely by blood-vessels; others, as the earth-worm, have small transverse membranes connecting the canal to the exterior covering of the body; but a mesentery, properly so called, exists in none. A thin membrane, forming an internal lining to the exterior integuments, may be regarded as a peritoneum.

In the echino-dermata we again meet with a perfect mesentery, and even sometimes with a kind of omentum. The mesentery of the echini is fixed to the shell, and makes turns exactly corresponding to those of the intestine, which it covers. In the star-fish there are as many mesenteries as ramified cæca in the branches of the body. They adhere also to the internal surface of the general covering, parallel to the axis of the branch. In the holothuria tremula, the mesentery is attached to the intestine from the mouth; it accompanies the tube to the other extremity of the body, following one of the longitudinal muscles; it then crosses, and returns to the mouth, following a second; crosses again, and redescends to the anus along a third. Let it, however, be remarked, that the numerous vessels of this animal are not found in the mesentery, but on the opposite surface of the canal. The interweaving of these vessels with each other, and with the respiratory organs, forms a singular species of omentum, concerned in the business of respiration.

The alimentary sac of the actiniæ is supported by several vertical membranes, which surround it like radii, and are fixed on the opposite side to the covering of the body.

The medusæ have no occasion for mesentery, their alimentary cavity being merely excavated in the gelatinous mass of their body: the fresh-water and other polypes still less so, inasmuch as their intestine and body are one and the same thing, that is, simply a bag formed of a gelatinous membrane.

Organs of Absorption.—No absorbing vessels can be discovered in the lower classes of animals now under our consideration. Cuvier thinks that the veins absorb in them; and he supports his sentiments by the following statement.

We are first, says he, led to this notion by observing that the blood of these animals does not differ from what is called lymph in the red-blooded classes: and also by the fact, that no anatomical method has hitherto enabled us to demonstrate the existence in these animals of any but blood-vessels. We have already observed that the parts, called by Poli lymphatic vessels, belong to the nervous system. There are, besides, some positive reasons; of which the principal is the natural communications of the great cavities

of the body, in which there is always much fluid to be absorbed, with the trunks of the great veins.

These communications are particularly obvious in the cephalopoda, where the principal branches of the vena cava are furnished with a multitude of bodies resembling ramified glands, and floating loosely in the abdomen. They have tubes manifestly ending in the trunk of the vein. Fluids injected into the vein penetrate like a dew the extremities of these ramifications, and pass into the abdominal cavity. Sometimes air will pass in the same way. There must equally be a passage in the opposite direction.

Among the gasteropoda, the aplysia exhibits a communication no less free between its veins and the great cavities of the body. If we impel air from the lung into the venæ cavæ, which are continuous in these animals with the pulmonary artery, the abdomen will be distended. The orifices, through which the air escapes, are visible to the naked eye: they must admit liquids from the abdomen, as they allow air to pass from the vessels into that cavity.

The passage of the rectum through the heart in the acephala is another point deserving attention. We cannot see what end this arrangement can serve, if the nutritive fluid does not find its way through the intestine into the heart, where it will be mingled with the blood, and set in motion.

This manner of viewing the subject coincides extremely well with the gradation of the organic systems, in the different classes of animals. Insects most probably have no vessel at all (see INSECTS, in *Anatomy*): it is, therefore, natural to find before them, in the scale, animals which have vessels of one kind only, and which, therefore, may be arranged between the vertebral division possessing the two kinds, *viz.* lymphatic and sanguineous, and the insects which have none; unless at least we regard the secretory tubes as a third order, the most essential, because common to all. The mollusca, vermes, and crustacea, seem destined to hold this intermediate rank. The echino-dermata, and particularly the holothuriæ, are of a doubtful kind: their place cannot be yet assigned.

In the zoophytes, properly so called, the substance of their body forming the sides of the alimentary cavity is immediately impregnated with the nutritive fluid. The medusæ do not differ in this respect from the simplest polypes, except that their cavity has numerous tubular prolongations. If these intestinal tubes are to be considered as vessels, the stomach will perform, with respect to them, the functions of a heart.

Organs of Circulation and Respiration.—As both these kinds of organs exist together in all the vertebral classes, there can be no variety in their combinations; but one or the other may be wanting in invertebral animals, so that we may establish between them in this respect relations, which are very constant in the classes, in which these organs are perfectly understood. Thus, in the mollusca, the worms with red blood, and the crustacea, which have a complete circulation, we find circumscribed branchiæ. Insects have the body nourished by a fluid, which stagnates instead of circulating; and in them respiration is effected by means of tracheæ, which are distributed over the whole body. True zoophytes, medusæ, and polypes, in which the body itself forms the sides of the intestinal canal, and directly absorbs its nourishment, have no particular organ for respiration. Probably the whole body respires.

The mollusca have a double circulation; that is, all their blood, after circulating through the body, passes through the lungs before it is fit to be circulated again.

The cephalopoda have three hearts, two composed of a ventricle and an auricle, and one of a ventricle only: the gasteropoda have one, consisting of a ventricle and an auricle; the acephala one, of a ventricle with two auricles; and the brachiopoda two, of a ventricle without an auricle. This class alone, in fact, exhibits nearly as many modifications of the circulating organs, as all the four classes of vertebral animals: these modifications, however, have reference to the number and position of the auricles and ventricles, not to the course of the circulation, which is always double.

The cephalopodous mollusca have the most complicated system of circulating organs of all animals, possessing three distinct hearts, two pulmonary and one aortic.

The descending vena cava, formed by the union of branches which return the blood from the head and arms, passes from the neck, along the front of the liver, towards the bottom of the abdominal sac: it receives the hepatic vein in its course, and immediately afterwards, that is about the middle of the abdomen, it is bifurcated, each branch going transversely to one of the lateral hearts; but before they arrive, they receive various branches from other parts. Thus, directly after their origin from the common trunk, each receives a vein from the intestines and back of the body; and at the very point of entering the hearts, each receives another from the lower parts. All these veins are extremely thin and transparent: they are much more capacious and extensile than the arteries; no valve can be seen in them, except at the entrance of the hepatic vein.

The two great transverse branches, which end in the lateral hearts, and all the veins immediately ending in them, are perforated by openings leading into very singular appendices of a ramified or glandular appearance, such as are found in the nervous system of no other animal.

They are numerous, large, and of an opaque yellowish-white: only two offices can be ascribed to them; either that of secreting some fluid from the arterial blood, or of absorbing the liquids of the abdomen and conveying them into the veins. The small number of their arterial ramifications favours the latter idea: it is sufficient for their nutrition, but not for a secretion proportioned to their volume.

The two lateral hearts are placed at the root of the branchiæ; they are more or less rounded, with thick, muscular, though rather soft parietes, and large fleshy columns, intercepting numerous spaces of different size. In the sepia octopus they are of a very deep brown red, as in a red-blooded animal, while all the other viscera, the muscles, and the aortic heart, are whitish.

The entrance of the vein into each lateral heart is furnished with two membranous rectangular valves, fixed at their bases and extremities, and loose only at the inner edge: they allow the blood to pass in, but prevent its return. The pulmonary artery goes out at the extremity of the heart opposite to the entrance of the vein. There is no valve at its origin in the octopus, but in the cuttle-fish and calmar there are four, shaped like small fleshy tubercles, surrounding the orifice of the artery, and preventing the return of the blood. They are a little beyond the origin, and in the very trunk of the artery. The latter runs along the external and posterior edge of the gill, producing as many lateral branches, perpendicular to its trunk, as there are plates of the gill. Their ramifications and distribution will be described in the article on respiration. A branchial vein is found on the opposite or internal and anterior edge of the gill, from which it collects the blood. Reaching the lower end of the gill, the vein quits it, and runs transversely towards the middle of the body, a little below and behind the part where the vena cava bifurcates. Here it ends in the third, aortic, or intermediate heart. This heart receives then two pulmonary veins, one from each gill, which end each on its own side,

fide, reaching the heart directly, and without any previous division. Their cardiac orifices are furnished with two membranous rectangular valves, analogous to those of the venæ cavæ in the pulmonary hearts.

The aortic heart is white, and of a firmer tissue than the two pulmonary hearts. Its form is oval in the longitudinal direction in the calmar; transversely in the octopus; and like the trefoil leaf in the officinalis. Its internal parietes exhibit numerous muscular columns, decussating in all directions. In the octopus it produces two principal arteries and some smaller ones, all arising immediately from the cavity, and not from a common trunk. The superior ascends nearly parallel to the vena cava, giving branches to it, as well as to the surrounding parts. The inferior is the largest artery, and indeed analogous to the aorta: having given branches to the lower part of the sac, it turns upwards behind the viscera to the head, and sends ramifications to the intestines, liver, œsophagus, then terminates, near the fleshy mass of the mouth, by a circle which surrounds the œsophagus, and supplies the crop, the salivary glands, the mouth and feet.

Gasteropodous Mollusca.—In all these, without exception, the pulmonary system is exactly inverse of that of fishes: that is, the heart is composed of an auricle and a ventricle, and it receives the blood from the lung to distribute it over the body; while the heart of fishes sends the blood from the body to the lung. In other words, the gasteropoda possess always a simple aortic heart. All the veins of the body end in one or two venæ cavæ, which, as soon as they reach the respiratory organ, are changed into pulmonary arteries, without this change being marked by a ventricle, nor even by valves. It is exactly the same as the change of the trunk of the intestinal veins into that of the vena portarum. The position and direction of these veins are determined by that of the pulmonary organ, which latter is usually found in the neighbourhood of the rectum, that they may receive more readily the veins of the intestines, which probably bring the chyle with them. Large trunks also come from the liver.

Thus, in the doris, where the branchiæ form a circle round the anus, the vena cava having collected the blood from the whole body, and traversed the liver, arrives above the rectum, and divides into branches, which separate like radii to enter the bases of the branchial tufts. These branchiæ return the blood, which has undergone their action, by vessels corresponding to those which brought it. The auricle, which is shaped like a pyramid with a very broad basis, has this basis disposed in a circular manner, and receives the blood from the pulmonary veins. It conveys this blood immediately into the heart, which is round, flat, and placed on the back of the liver. The heart has valves at its entrance and exit: the latter is the origin of a large artery divided immediately into four branches. One is turned back, and soon lost in the liver; two others also enter this gland; the fourth, which is the continuation of the trunk, goes directly forwards, giving branches to the intestine, stomach, salivary glands, organs of generation and mouth, and is lost ultimately in the fleshy mass of the foot.

The tritoniæ and phyllidiæ have the lungs at the two sides of the body, and the heart consequently in the middle, towards the back. The auricle, placed at the back of the heart, extends transversely from one side to the other. It receives the blood from two or rather four pulmonary veins, which extend on the two sides of the body, from one end to the other, in the substance of the fleshy covering, and receive the blood from all the branchial tufts. The latter had received it from two arteries reaching in the same way along the side of the body, and placed parallel to the veins. These pulmonary arteries collect the blood from the body by six large veins, three on each side, coming principally from the liver and intestines. The veins of the muscular covering end in these trunks without quitting its substance. Having thus received from the lung the blood, which has circulated through that organ, the heart distributes it over the body by three large arteries, one of which goes backwards into the ovary, another downwards to the liver and intestines, and the third forwards to the male organs of generation, the mouth, and the fleshy mass of the foot.

The onchidium has some resemblance to the tritonia. Two vessels are formed in the same manner in the fleshy covering on the two sides, and they convey the blood of the body into the lung; but by their extremity only, since the lung itself is excavated in the back of the body. These vessels receive the blood from the viscera by many small veins entering separately, and that of the fleshy covering by others excavated in its thickness. The heart is near the lung behind on the right side. Its auricle is very large, and furnished with fleshy columns. The heart produces one great trunk, which first gives a branch to the liver and viscera, then a long retrograde one to the rectum and organs of generation, which are situated behind and on the right. It afterwards passes in the collar of the œsophagus, and gives two large branches to the general covering. The right sends an artery to the salivary gland of its side; the left does the same, and moreover one to the male organ of generation: the trunk is then lost in the mass of the mouth.

The aplysia possesses one of the most curious circulating systems. There is excavated on each side, in the fleshy covering, a large vessel surrounded by muscular bands decussating in every direction: these vessels receive the blood by ordinary veins from certain parts. Two come from the gland which surrounds the shell, and produces the purple liquor: but it is very clear that they communicate immediately with the abdominal cavity by several large holes. Are the latter shut during life by muscular contraction, or by any fine membrane? We do not hitherto know. However this may be, the two large vessels unite behind, and thus produce a third, which is the pulmonary artery. This is also very large, and runs forwards along one side of the membranous triangle which supports the branchiæ on its two surfaces. It distributes the blood to all the branchial plates by a corresponding number of branches: this blood returns by corresponding vessels into the pulmonary vein, situated also in the branchial triangle, and terminating in the auricle. The heart is situated crosswise, along the middle of the body, a little towards the left, inclosed in a pericardium. The auricle is large, thin, transparent, and strengthened by muscular fasciculi, which intercept lozenge-shaped spaces. The ventricle is oval and thick, and has strong muscular columns: it has valves only at its entrance, they are rectangular. The artery is divided at its exit into three principal trunks. The first goes to the left, for the liver and intestines; the second forwards to the stomach; the third and longest remains longer in the pericardium, inclining towards the right. It possesses in this situation a very extraordinary apparatus of unknown use; namely, a double crista filled internally with ramifications, arising from the artery itself, and filled by injecting the artery. They appear to have blind terminations; and the liquid they contain appears to pass back simply into the vessel, without entering any veins. After quitting the pericardium, this artery gives a branch for the corresponding part of the muscular covering, then goes directly forwards under the œsophagus. Arriving at the crop, it sends a retrograde branch

to the general covering; under the nervous collar of the œsophagus it produces a second, which goes backwards to the left in this covering; then immediately afterwards a third, which goes to the right for the penis. The trunk is then bifurcated, and lost in and about the mouth.

The lung lies on the front of the body in the slug, and the heart is placed immediately under it. The innumerable ramifications spread over the internal surface of the lung all end in the auricle, and the latter in the ventricle placed under it, and producing behind two large arteries. One suddenly turns forwards to the mouth, the generative organs and the general covering; the other goes directly backwards, and is distributed to all the viscera.

The circulation of the pleurobranchus much resembles that of the aplysia. But, as the heart is placed more forwards, the posterior artery is the largest of the three, since it has more parts to nourish.

In the testaceous gasteropoda, the heart and its auricle are situated in the bottom of the great pulmonary cavity, which occupies the upper part of the front of the body, towards the edge of the shell. The lung, whatever may be its form, receives the blood of the body, and a particularly large portion from the last part of the intestine, which runs close on the surface of the pulmonary cavity, opening sometimes within it, sometimes at its edge. Having passed through the lung, the blood enters the auricle, goes thence into the ventricle, from which it is sent over the whole body by arteries, which vary according to the general form of the animal.

The branchiæ form a series all round the body, under the cloak, in the patella. The pulmonary vein is also disposed in a circular manner, collects the blood from all the branchial plates by many small veins, and carries it to the heart, which is situated above the head, and distributes it over the whole body.

Acephalous Mollusca.—In such of these as have the heart in the back, and traversed by the rectum, it is perfectly symmetrical, oval, broader behind, and accompanied by an auricle on each side. Their branchiæ form four parallel plates: each auricle receives the blood from the two branchiæ of its own side, and transmits it to the heart. These auricles are triangular, broad towards the branchiæ, and pointed towards the heart: sometimes they have a kind of cristæ, susceptible of dilatation. Their sides are transparent, and possess few projecting threads. Their openings into the ventricle are furnished with valves, which allow the blood to pass only from the auricle to the ventricle. The latter is much stronger than the auricle: its sides are opaque, and furnished with numerous fleshy columns. The blood goes from it by two arteries situated at its two extremities; these follow the rectum, one ascending towards the head, the other descending to the anus. Such is the heart of the anodontites, or fresh-water muscle, of the venus, mactra, cardium, solen, pholas, mya, and apparently of all the equivalve bivalves.

But the bivalves with unequal shells, at least the oysters and the pectens, have the heart differently placed: it occupies a cavity between the mass of the liver and the muscle that closes the shell; and is directed from behind forwards, or from the back to the branchiæ, and not, as in other bivalves, from above downwards, or from the anus to the head. In this case the auricles, or rather the single bilobed auricle is situated before the heart, and not at the side. This is remarkable in the oyster on account of its thickness, and deep red colour. It receives the blood from the branchiæ, and the heart distributes it to the body by two vessels which pass out at the extremity opposite to the auricle, and go, one upwards to the liver, the other downwards to the muscle.

Each branchia has an infinite number of small, straight, parallel vessels, terminating perpendicularly in a larger one at the back of the branchia: these dorsal trunks convey the blood to the auricle. But each branchia has at the same time another series of small vessels, similar and parallel to the first, and pouring the venous blood into their extremities. This blood is brought by another vessel at the back of each branchia, which vessel receives the veins of the body.

The circulation is carried on in the *pteropoda*, as in the gasteropoda, by a simple heart, with one auricle, which receives the blood from the lung, and transmits it to the body. These things may be seen in the hyalæa and pneumodermon.

Cuvier states, that he has dissected only one genus of brachiopoda, and found two distinct hearts, both aortic, that is to say, receiving blood from the lung, and sending it to the body.

Thus we find that the whole class of mollusca possesses a circulation as complete as any vertebral animal; and that this circulation is double. When there is only one ventricle, it is aortic, and not pulmonary; when more than one, they are separate, and form so many distinct hearts. The passage from the arteries to the veins, in the little as well as in the great circulation, is as evident as in animals of the higher classes.

Blood and Circulation of Worms.—The blood is transparent, or at most a little blueish, in mollusca and crustacea. The supposed red blood of some of the first class is merely a secretion. But the entire class of articulated worms, both marine and terrestrial, has the blood more or less red, and often of as deep a tint as in any vertebral animal. It may be seen in the genera lumbricus, hirudo, naias, nereis, aphrodite, amphinomia, amphitrite, terebella, and serpula. But the lumbricus marinus (arenicola) exhibits most plainly, not merely the colour of the nutritive fluid, but also its course and direction: the yellow colour of the intestine and the grey colour of the parietes of the body allowing all the vessels to be perfectly distinguished.

A large vessel, diminishing in size at the two ends, lies along the back, between the branchiæ. It sends forward the blood by its anterior origin, and receives fifteen lateral vessels on each side, one from each branchia. They bring the blood from those organs, and are to be regarded as pulmonary veins: when the branchiæ contract, the large vessel is distended. The blood is carried back to the branchiæ by vessels similar in number to the preceding, but not all arising from a single trunk. The nine first proceed from a large vessel situated upon the intestinal canal immediately under the one first described. The others come from the back part of a vessel parallel to the two first, but situated under the intestinal canal. These two great longitudinal trunks send all their blood to the branchiæ: they represent both venæ cavæ and pulmonary arteries; for those branches which do not go to the lungs are veins returning the blood from the various organs. These branches of the vena cava in the lumbricus marinus are spread over the yellow surface of the intestinal canal with an admirable regularity; and the beauty of the arrangement is heightened by the splendour of their purple colour.

All these branches arise, in the first instance, from two vessels, which proceed along the sides of the intestinal canal, and perform the office of an aorta. They ascend as far as the lower part of the œsophagus, and then are bent to communicate with the great pulmonary vein, with which the description began. At this communication there is a swelling, which exhibits to the naked eye more marked contrac-

tions

tions and dilatations than any other part of the syſtem: although their parietes are no thicker than thoſe of the other veſſels, their enlargements may be called hearts; but as they are not found in all worms, it would be more exact to ſay that the circulation is carried on in theſe animals by the veſſels only, without a heart. If, however, the exiſtence of a heart be admitted, at leaſt in the lumbricus marinus, it muſt be conſidered as double, and, like that of the two preceding claſſes, aortic.

The aphrodite, amphinomiæ, and nereids, differ from the lumbricus marinus, only in having a greater number of pulmonary veſſels correſponding to the greater number of branchiæ. But in the ſpecies which have their branchiæ on the neck, as the amphitrite, the pulmonary veſſels form four trunks, two arterial and two venous, coming from the trunks, which extend the whole length of the body, upon the inteſtine, and ſimilar to thoſe which have been deſcribed in the lumbricus marinus.

The colour of the blood is more difficultly perceived in the leech, becauſe it is paler and leſs contraſted with the ground of the body; yet the veſſels may be eaſily diſtinguiſhed, and injected with mercury. There is a large longitudinal veſſel on each ſide, communicating together, both towards the belly and back, by tranſverſe branches, the ramifications of which, diſtributed in the ſkin, probably ſerve for reſpiration, as no other organ can be found out. Along the back we obſerve a middle and ſlender veſſel, not ſo immediately connected to the two others, as they are to each other, and producing branchiæ on each ſide. This probably belongs to the arterial, and the two others to the venous ſyſtem; but their connection has not been hitherto diſcovered.

Longitudinal veſſels, producing ramifications filled with a fine red blood, may be ſeen in the earth-worm.

Movements of ſyſtole and diaſtole are very manifeſt, and quickly performed in all theſe red-blooded worms.

Echino-dermata.—I have not, ſays Cuvier, been able hitherto to arrive at any clear notions concerning the arrangement of the vaſcular ſyſtem in this order; but the following is the reſult of my reſearches.

The inteſtinal canal of the holothuria tubuloſa is twice folded, and conſequently forms three portions. The middle of theſe has a veſſel at its ſide, diminiſhing towards the two ends. It receives numerous ſhort veſſels from another tube, which will be deſcribed laſt; and it produces from the oppoſite ſurface others, which are much ſubdivided, and whoſe branches are at laſt united into an equal number of ſmall veſſels to end in a ſecond trunk, which will be deſcribed. The net-work produced by this ſubdiviſion of the branches of the firſt veſſel, before they end in the ſecond, is intimately interwoven with the ſmall branches of a hollow ramified organ ending in the cloaca, and probably concerned in reſpiration. This organ can be diſtended with water, or emptied at the will of the animal, and thus probably admits of the blood being acted on by the air. The firſt veſſel, then, would be a pulmonary artery, and receive the blood from the body to tranſmit it to the lung. We have ſeen the branches, by which it receives blood from the inteſtine: that of the reſt of the body comes from a veſſel, which will be deſcribed third in order, having been brought by veins which are perceived over the whole meſentery.

The ſecond great trunk is divided into four great branches, united by a tranſverſe one: two receive the blood from the lung, and run parallel to the firſt trunk, but at a diſtance ſuited to the ſubdiviſions of branches which go from one to the other. Theſe two branches are a kind of pulmonary veins: they convey the blood, which has undergone the action of the lung, into the two other branches by the tranſverſe canal, and by their extremities; for there is a viſible communication between them. Theſe other branches, which conſequently perform the office of aorta, run along the firſt portion of inteſtine, ſending blood to it by an infinity of ſmall, but rather long arteries, which ſeem to terminate immediately in the body of the inteſtine. The ſuperior branch, arriving at a certain height, is bifurcated, and its two ramifications are joined ſo as to form a circle round the œſophagus, from which five arteries go off to the maſs of the mouth and the general covering of the body. The blood returns from this covering by veins, which fill the meſenteries: but there is alſo a general trunk, which ſeems to form a kind of vena cava. It is made up of four principal branches, united by a tranſverſe one. Two of theſe branches, which run along the firſt portion of inteſtine, receive the blood from it; and the two others tranſmit it to the pulmonary veſſel by the ſmall branches already mentioned at the beginning of the deſcription.

According to this repreſentation, the arrangement would very cloſely reſemble that of worms.

In the aſteriæ and echini the ſame approximation is obſerved between the vaſcular and digeſtive ſyſtems. The principal vein and artery equally run along the inteſtinal canal in the latter; and they are multiplied in the former to follow the cæca.

Nothing like blood-veſſels can be ſeen in the meduſæ. "The ſubſtance of theſe zoophytes," ſays Péron, "preſents at firſt view the appearance of a kind of jelly, more or leſs diaphanous, conſiſtent, and agreeably coloured according to the ſpecies. Excepting the lines, lamellæ, and veſſels of the lower ſurface of the umbella, their ſubſtance appears homogeneous, even when examined with the moſt powerful magnifiers. However it may be torn or cut, the appearance is the ſame, and no trace of internal veſſels can be diſcovered. Such indeed are the denſity and homogeneouſneſs of this matter, that we can hardly conceive it to be penetrated and nouriſhed by veſſels." Annales du Muſéum, t. xv. p. 42.

Organs of Reſpiration.—Cuvier obſerves that theſe exhibit, in invertebral animals, the ſame relations to the organs of motion, and particularly to the force which animates thoſe organs, as in the vertebral claſſes, and thus confirm the theory which aſſigns the degree of motive power as a meaſure of the quantity of reſpiration. Thus, the only claſs in this diviſion of the animal kingdom, in which moſt of the individuals have the power of flying, is that in which reſpiration takes place at all points of the body, in which the tracheæ convey air to all parts; in ſhort, inſects. In ſome of thoſe which have no wings, and therefore do not fly, the power of the muſcles is evinced by the rapidity of their other motions. Let any one obſerve the centipede running, or the flea jumping, and he will acknowledge that they belong to a claſs poſſeſſing great muſcular power, as he would judge of the oſtrich and caſſowary, although they are birds without wings.

The molluſca, ſuperior to inſects in their circulating organs, and particularly in the central parts of their nervous ſyſtem, have a circumſcribed reſpiration; they breathe only by the lungs, and no portion of air is admitted into the reſt of the body. It is therefore only neceſſary to compare the ſlowneſs of their motions, with their rapidity in inſects, to eſtimate the effects of thoſe differences in organization.

Invertebral animals poſſeſs either lungs more or leſs analogous to thoſe of reptiles; branchiæ, ſometimes ſimilar to thoſe of fiſhes, ſometimes to thoſe of tadpoles; or laſtly, tracheæ, a kind of organ not known in the vertebral diviſion. The latter is peculiar to inſects; the former to a ſmall number

ber of mollusca; the second is the most common, and is found in most mollusca, in worms, and crustacea. The mode of respiration is not well known in the echino-dermata, so that their organs cannot be classed with certainty.

The effect of respiration cannot be estimated by the colour of the blood, except in red-blooded worms, where it is very obvious: it may be seen without ligature or incision in the branchiæ of the lumbricus marinus. But the effect of this function on the respired air may be easily judged: the researches of Vauquelin and other naturalists have shewn that invertebral animals consume oxygen like others, and infect the residue with carbonic acid. See Respiration.

Respiratory Organs of the Mollusca.—We meet in this class with lungs, with uncovered branchiæ, and with branchiæ contained in a cavity. In the cephalopoda and acephala they are always of the latter kind: the gasteropoda have all three sorts. A lung is found in the terrestrial gasteropoda, and in those aquatic kinds which are obliged to come to the surface of the water in order to take in air. The principal genera that have it are the snail (helix), slug (limax), the testacella and parmacella, among the terrestrial; in the onchidium, bulimus of pools (helix stagnalis), and planorbis, among the aquatic. This lung is a larger or smaller cavity, communicating externally by a narrow aperture, which can be opened or closed voluntarily, while the cavity, contracting or dilating at the same time, expels or admits air. As the parietes are muscular, and there is no bony structure, there is no other mechanism than muscular contraction. The parietes of the cavity are furnished with an almost infinite net-work of blood-vessels, ramified in a rather spongy substance. The cavity itself is placed on the neck, and opens at the right side of the chest, in the snail, slug, bulimus, and planorbis; on the back, and opens on the right side of the body, in the parmacella; on the back, and opens backwards, in the testacella; on the posterior part of the body, and opens behind, under the edge of the cloak, in the onchidium.

The branchiæ projecting externally, sometimes represent tufts or trees, as in the tritoniæ, where they form a kind of hedge all round the body, and in the doris, where they have a circular arrangement round the anus, at the posterior part of the back; sometimes in small laminæ or scales, as in the eolides, where they are disposed like tiles on the back, in the phyllidiæ, the oscabrio, the patellæ, where they form a cordon all round the body, under the edge of the cloak. In the scyllea they are pencils of filaments, dispersed over fleshy plates, or a kind of wings placed on the back. In the glaucus they resemble fins, radiated like a fan: in the pleurobranchus they are small plates, arranged in transverse rows on the two surfaces of a prominent plate at the right side of the body.

Testaceous gasteropoda have prominent branchiæ, but situated in a cavity concealed under the edge of the shell. The opening is generally very free, and occupies all the upper part of the animal's neck. Often also a part of the fleshy edge of the cloak is prolonged into a small canal, lodged in a corresponding canal of the shell, and calculated to conduct the surrounding element into the branchial cavity, even while the animal is entirely inclosed in its calcareous habitation. These canals are found in all the genera made out of those united together by Linnæus under the names buccinum, murex, and strombus. In most of the genera the branchiæ form one or two long series of transverse plates, occupying the whole length of the cavity, but a part only of its breadth, and representing, sometimes a prism, sometimes a kind of pen fixed by the whole length of its stem. There is a single series in the murex tritonis; a large and a small one in the buccinum undatum; two large ones in the halyotis.

Some genera however deviate from this general rule: the patella Hungarica, which seems so much like the other patellæ, has its branchiæ arranged in small long plates, placed within a cavity above the neck, but forming a transverse series round the edge of the cavity.

The course of the blood, however, is the same, whatever form the branchiæ may possess in the gasteropoda: each division and subdivision receives a pulmonary arterial branch from the vena cava, and sends a venous branch into the pulmonary vein, which terminates in the heart. The position of the branchiæ regulates that of the heart, as well as the course of the large vessels.

The branchiæ of the acephala are formed into plates, each composed of a double leaf: they have a double series of vessels, very regularly and closely arranged, like the teeth of a fine comb, the striæ being at right angles to the length of the plate. An artery and a vein run along the basis of the plate. The testaceous acephala have four of these plates, inclosed between the two lobes of the cloak, and allowing the foot to pass between them when there is one. The internal surface of the four triangular plates surrounding the mouth, and occupying the place of lips or tentacula, is also striated with vessels similar to those of the branchiæ, and may probably assist in respiration.

Poli speaks of small air-vessels, commencing in the small tentacula, usually situated at the posterior edge of the cloak, or round the orifice of the branchial tube: he supposes that they penetrate to a certain reservoir, whence the air passes into the interior of the branchiæ. Cuvier has not found this structure, and thinks that respiration is carried on in the acephala, as in other mollusca and fishes, by the simple afflux of water over the external surface of the branchiæ.

Some genera bring this water to the branchiæ by simply opening the shell and the anterior edges of the cloak. It is expelled by again shutting the shell. In the muscle, which has the widest opening of the shell behind, the water passes in and out at this part. When the animal is placed in water, a slight motion of the fluid is perceived in this situation, produced by the process of respiration. In the genera which have the cloak prolonged behind into one or two tubes, the water enters, and is discharged by the tube farthest from the back, or by the analogous canal, when there is only one tube: for it is then divided into two canals. The cardium, venus, mactra, tellina, &c. &c. have two tubes; the pholas, solen, teredo, mya, &c. have only one. They can partly withdraw the tubes into the shell by means of two flat, fan-shaped, retractor muscles, attached to the lobes of the cloak: but they do not extend them simply by muscular action; for they may be seen to increase in length and breadth both at the same time in the pholades.

In the ascidiæ, which are naked acephala, the branchiæ do not form four plates, but a single large sac, with an extremely fine vascular net-work. This bag is filled with water as often as the animal dilates it: the mouth is at its bottom. In the biphori, or talpæ, and the thalia, they form only a narrow ribbon, obliquely traversing the interior of the body: the water, in passing through this from before backwards, necessarily goes over this ribbon.

The cephalopoda also have their branchiæ inclosed in a cavity, that is, in the bag forming their body. They are separated from the other viscera by the peritoneum, and their cavity communicates externally by the funnel under the neck. The water is admitted and expelled by the dilatation

and contraction of the muscular parietes of the bag: thus it is renewed in the branchiæ. The latter are two large pyramids, placed at the side of the peritoneum, with their base towards the bottom of the sac, and the apex towards the infundibulum. Each is attached by a membranous ligament to a muscular column which adheres to the sac, and sends a process to each of the plates of which the pyramid is composed. The pulmonary artery, arising from the lateral heart of its own side, ascends along the external edge of the branchia, giving two arteries to each plate. The pulmonary vein, which terminates in the intermediate heart, descends along the internal side of the branchia, receiving two veins from each plate. The plates themselves are arranged one over the other, parallel to the basis of the pyramid: their figure is triangular, and the two surfaces exhibit rows of pencils, filaments, or minute ramifications, which are the ultimate divisions of the pulmonary vessels. Each branchial pyramid of the calmar has as many as sixty of these plates, while we find only nine in the octopus; but in the latter the rows of filaments are more minutely ramified, and form much thicker strata.

Respiration must be effected by the admission of water to the branchia, and by its penetration among all the fine processes of their surfaces; in the same way, in short, as in other instances.

Instead of branchiæ, the brachiopoda have a circle of small triangular plates attached to each lobe of the cloak.

Among the pteropoda, the hyalæa has them concealed in the two folds of the cloak; they represent vascular ramifications on the wings of the clio; and in the pneumodermon they are small plates, forming various lines on the surface of the abdomen.

In the singular animals called anatifæ and balani, there are found, on each side, at the basis of the arms or tentacula, conical plates, equal in number to that of the arms, but having a contrary direction, namely, towards the back, and lying against the body under the cloak. Their relation to the vascular system has not yet been determined.

Thus we find, in all the mollusca, as complete an apparatus for respiration as for circulation. An extraordinary additional or secondary office of the branchiæ is that, which they perform in some acephala, of affording a receptacle, for a certain time, for the ova, and even for the young when hatched.

Organs of Respiration in Worms.—Leeches and earthworms, as well as the thalassema, have no other apparatus for breathing but the skin and its vascular net-work: but in other genera there are ridges or tufts, in which the vessels are ramified. Those which swim freely in the water have the organs equally arranged on the two sides, along a more or less considerable portion of the back. Such as live in tubes have them usually placed on the head, that they may be more easily exposed to the water.

In the aphrodite aculeata they are small fleshy cristæ, slightly resembling that of the cock, situated above each of the tubercles, which support bristles. There are forty pairs. In the scaly aphrodite they are small bundles of filaments.

In the nereids there are small fleshy cones, amounting to two or three on each side of a ring: the blood-vessels are ramified in them with wonderful delicacy. Sometimes, instead of these small cones, there are true filaments grouped into pencils, of three, or seven, or even in the form of tufts. Sometimes there are small thin plates.

In the terebella flava the branchiæ represent bipinnated leaves, and have a beautiful rose-colour. There are thirty pairs. In the tetraedra and caruneulata there are merely large fasciculi of filaments. Their number in all these genera is the same as that of the rings of the body.

The arenicola (lumbricus marinus) has only fourteen pairs occupying the middle of the back, and resembling small close bushes, of the finest carmine when distended with blood, and becoming pale again when empty.

The terebella have branchiæ in the form of small close trees; there are only three pairs, situated in the back, near the head.

In the amphitrites there are two pairs in the same situation, but shaped like feathers, very thick.

They form, in the serpulæ, at the sides of the mouth, two beautiful fan-like processes, with feathery branches, having long stems and short barbs, and exhibiting the finest colours. The number of feathery processes, as well as the general curvature of the fan, varies according to the species.

The sabellæ (amphitrite ventilabrum, Linn., &c.) have fan-like branchiæ, as well as the serpulæ. Sometimes the fan has a spiral turn.

In these animals each branchia has a vascular, arterial and venous system, as in the higher classes. But we come to an end here of respiration by expansion of the vascular system.

Respiration of the Echino-dermata.—Monro regarded the feet, or those cylindrical and extensile tentacula, by means of which the echini, asteriæ, and holothuriæ walk, as organs for absorption of the surrounding fluid, at least in the first of these genera. Cuvier assigns this function, in the two first named genera, to organs much smaller and more numerous, which may be seen in a living asterias observed in water. Besides the great tentacula of the lower surface, the whole integument bristles with small fleshy tubes, which are withdrawn into small openings as soon as the animal is taken out of water. They form a beautiful spectacle in the large species, coming out at all points: the very spines produce them by small apertures along their stems; and while the minute tubes are extended, they resemble small leaves of trees connected to their branches. There are species in which they form tufts, &c. round these spines. Those tubes which are situated on the sides of the feet, are generally longer than the others. It can hardly be doubted, that they have the office of conveying water into the interior of the body.

The holothuriæ, at least the tubulosa, have no tubes projecting externally, but they have an internal organ, which must be subservient, according to all appearance, to respiration. It is one or more membranous and hollow trees, of which the trunk opens into the same receptacle (cloaca) as the anus. It enters the body, dividing and subdividing, until it ends at last in small conical productions. The branches swell at intervals into vesicles, which are generally found more or less distended with water.

The holothuria tubulosa has a single trunk, divided from its origin into two principal branches, of which one proceeds along the general covering, adhering to it by a kind of mesentery; the other runs among the intestines, interweaving its branches with the vessels already noticed. This connection is so intimate, that it cannot be detached without laceration: probably there is a communication at this point between the nutritive fluid and the surrounding element.

The holothuria pentactes has two distinct trunks, deeply divided into large branches; other species have only one, which is not divided.

All animals situated below these in the scale, are destitute apparently of respiratory apparatus.

The genera medusa and rhizostoma, whose numerous vessels are expanded in the thin edge of their disk, may probably

bably refpire by this part: but the zoophytes, properly fo called, beginning with the armed polypes (hydra), breathe, if at all, by their whole furface.

If, as fome have conjectured, the vibrating organs of the vorticellæ and rotifers are an apparatus for breathing, thefe animals ought to occupy a higher rank in the fcale of being than they do now. Their extreme minutenefs muft oppofe great obftacles to our acquiring any exact knowledge about them.

Phyfiology of Refpiration.—The changes produced in the air by the refpiration of the mollufca, &c. have been already fpoken of in the article RESPIRATION, towards the end, under the head of *Refpiration of Animals*. We have only to notice here the facts that have been afcertained refpecting their temperature.

"Spallanzani obferves," fays Mr. Ellis, "that when a fnail or flug is infulated in a jar of atmofpheric air, a thermometer placed in the jar will continue ftationary; but when feveral are confined together, the mercury rifes one-tenth, one-feventh, and even one-fifth of a degree, and in oxygen gas, one-third of a degree; from which he concludes, that fnails and flugs, in decompofing oxygen gas, give out caloric enough to be fenfible to the thermometer. (Memoirs on Refpiration, p. 255. 258.) This experiment we repeated, by confining feveral fnails in a pint jar of air, from the top of which a fmall thermometer was fufpended, and at the bottom a glafs of lime-water was placed. A film of carbonate of lime foon overfpread the lime-water, the infide of the jar was dimmed by moifture, and the mercury in the thermometer rofe at the fame time nearly one degree. Dr. Martine fays, that from the refult of feveral trials which he made, fnails were about two degrees warmer than the air. (On Thermometers, p. 141.) Mr. Hunter found the lungs of fnails 38°, when the atmofphere was 34°; and, in other inftances, fnails were fix and feven degrees above the atmofphere, when it was fo low as 30°. Earth-worms he found 58.°5, when the atmofphere was 56°; and, in other trials, the worms exceeded by four, leeches by three, and flugs by four degrees the temperature of the ambient air. (Treatife on the Blood, p. 298, et feq.) The temperature of a fnail, which was 44°, fank, on expofure to a cold mixture, down to 31°, and then froze; and feveral leeches froze likewife when reduced to 31°. (Obfervations on the Animal Economy, p. 105.) In all thefe experiments, the animals, when thawed, were found to be dead; but Mr. Carlifle fays, that the garden-fnail may be frozen, during its ftate of dormancy, without deftroying its mufcular irritability. Philof. Tranf. 1805, p. 18." Inquiry into the Changes, &c. p. 215.

Generative Organs.

Generative Organs of the Mollufca.—Four combinations are met with in this clafs: viz. 1. Separate fexes with copulation; in feveral gafteropoda, as the buccinum. 2. Separate fexes without copulation; in the cephalopoda. 3. The fexes united with reciprocal copulation; in the fnail, and moft gafteropoda. 4. The fexes united, and fecundating each other in the fame individual, or perfect hermaphrodifm; in the acephala.

The Cephalopoda; Male Organs.—The tefticle is a large, whitifh, and rather foft gland, found in the bottom of the abdominal fac; its ftructure is remarkable, and eafily developed. It is inclofed in a membranous capfule, united to it only by veffels paffing between them, and that at one point only: it has a thin proper cellular tunic. Its furface exhibits an infinite number of fmall areolæ, which are the commencement of white, opaque, foft filaments, lying clofe together and compofing the whole fubftance of the gland. In the cuttle-fifh thefe filaments are fmall and numerous, fo that the areolæ are mere points. In the octopus the filaments are larger, and like ribbons. They unite fucceffively to form trunks, which terminate in the cuttle-fifh, in vaft numbers, in three or four large excretory canals paffing through the gland in various directions, and ending ultimately in a large common circular opening, furnifhed with a valve which prevents the return of the fluid. In the octopus, which has fewer filaments, the large common canals do not exift, but the filaments end immediately at the common opening. Thefe filaments are themfelves fmall excretory veffels, furrounded by glandular parenchyma, and connected by blood-veffels, nerves, and cellular fubftance. The fluid they fecrete is poured out through the opening into the membranous capfule, from which it is conveyed by a canal reprefenting the epididymis, and tortuous, like that tube in the human fubject. It ends in a larger canal, of which the interior has at firft feveral projecting and ramified columns and ridges, and afterwards a fingle one extending through its whole length, and dividing it into two half canals. This canal, much fhorter and lefs tortuous than that of the epididymis, contracts towards its end, and penetrates a tolerably large cylindrical glandular body, poffeffing a large excretory duct, which receives the termination of the canal juft mentioned.

This body is large and folid in the octopus, much lefs and nearly membranous in the cuttle-fifh. It is regarded as a kind of proftate. Its canal joins one of the two belonging to the cavity which contains the fpringing tubes, which will be fpoken of prefently.

This cavity or burfa, which is large and much folded, is capable of confiderable extenfion, and contains the celebrated tubes, firft imperfectly defcribed in the cuttle-fifh by Swammerdam, then more in detail by Needham in the calmar, and rendered famous by Buffon, who derived from them the principal fupport of his fyftem, on the nature of the fpermatic animalcules. The octopus has them larger than the two other fpecies. The burfa, which contains them mixed up with a vifcid liquor, is compofed of two compartments communicating together, but each poffeffing a diftinct orifice. One of thefe orifices is the commencement of a flender canal, which ends on the exterior of the penis at the fide: the other alfo produces a canal, which, after having become ftill fmaller, opens externally near the bafe of the penis.

The penis is a hollow, cylindrical, flefhy body, perforated at its point, and having a cul-de-fac behind the place where the canal juft mentioned opens. Its cavity poffeffes flefhy columns internally.

The excretory canal of the proftate, which is to tranfmit alfo the feminal fluid of the tefticle, communicates more particularly with that compartment of the burfa, whofe duct opens externally on the penis. The communication indeed is very near its orifice. It is the other compartment of the burfa, whofe duct opens in the penis. The name of penis is given to this part, becaufe it projects externally, and has a cylindrical form: it does not feem, however, to be an organ of copulation, although it certainly is one of ejaculation.

All the canals now defcribed, from the tefticle to the penis, are fituated on the left fide of the abdomen, and the penis projects within the left branchia; but as the funnel placed under the neck clofes the flefhy bag, it feems impoffible for the penis to approach the part which gives iffue to the oviduct of the female, fo as to produce copulation. The feminal fluid thrown out by the penis muft traverfe the funnel, as the ova, the ink, and the excrements do.

Swam-

Swammerdam and Needham took the burſa of the ſpringing tubes for the teſticle, from which it is conſiderably diſtant. They have been fo̊llowed in this error even by modern authors.

The tubes themſelves are membranous bodies like worms, terminated by a filament thinner than their body, ſix lines or more in length. While they remain in their viſcous liquid, or if placed in ſpirits or oil, they continue at reſt; but if they are put in water, they become agitated, twiſt about, and throw out at one extremity an opaque matter. By means of a glaſs we can ſee in their interior an opaque whitiſh body, ſpiral like a cork-ſcrew, terminating behind in a ſpongy maſs, and before in a ſimilar ſmaller one. It ſeems that this body is elaſtic, and retained by the external membrane of the tube; that water, by ſoftening and diſſolving the extremity of the tube, allows the ſpiral or ſpongy body to exert its natural elaſticity; and that the twiſting of the tube ariſes from the effort which the ſpiral body thus makes to eſcape. However the matters may be explained, the motion certainly is not a vital one, and may be ſeen in the tubes of a cuttle-fiſh, which has been preſerved for years in ſpirits of wine, as ſoon as they are put in water.

But what purpoſe is ſerved by theſe tubes? Are they, like the pollen of plants, capſules containing a ſeminal aura, and not giving way to allow its eſcape, until they are in a proper ſituation? They ſeem to be developed only in the burſa, which contains them, and they are not found at all ſeaſons. Are the ordinary ſpermatic animalcules to be conſidered analogous to theſe tubes, according to the notions of Buffon?

Female Organs.—They are more ſimple. The ovary occupies a ſituation analogous to that of the teſticle, and is in the ſame manner enveloped by a membranous capſule, to which it is connected at one point only by veſſels. The capſule is ſimple in the octopus, divided into two by a ſeptum in the cuttle-fiſh.

The ovary has thouſands of ramifications, and reſembles the moſt complicated and beautiful tree. The ova enlarge unequally: at the end of a certain time we find them large, preſſed together, and angular. Two tubes go from the capſule in the octopus, and the calmar ſagittatum of Lamarck. In the former, when empty, they are ſmall, and plaited internally. They end at the ſides of the anus. At one-third of their length is a knot, which is a gland traverſed by the ova, and furniſhing them with their external covering. It is divided, like an orange, by longitudinal ſepta.

In the calmar ſagittatum there are ſimilar glands, much larger in proportion, oval, ſituated at the very end of the oviducts, and divided by very numerous, thin, tranſverſe ſepta. The oviduct enters at the ſide, and contracts conſiderably before going out.

The cuttle-fiſh and common calmar have a ſingle oviduct terminated by a gland of the ſame kind. The duct of the latter is larger, and makes two convolutions.

The ducts of the calmar ſagittatum end at the inner ſide of the branchiæ: the ſingle tube of the cuttle-fiſh and common calmar terminates near the left branchia, in the ſame ſituation as the penis of the male.

Theſe three ſpecies have alſo three enormous oval glands, divided, like that of the oviduct, by tranſverſe ſepta, and opening at the ſides of the anus. Their uſe is unknown.

The eggs of the octopus and calmar are united by a gelatinous ſubſtance into ſmall maſſes, while thoſe of the cuttle-fiſh are united by a ductile matter into bunches, like thoſe of grapes. The uniting medium is probably furniſhed by the glands which terminate the oviduct: perhaps the three glands juſt mentioned may alſo be concerned in furniſhing it.

Hermaphrodite Gaſteropoda.—They muſt be arranged in two ſections; thoſe in which the organs of the two ſexes have a common iſſue, as the ſnail; and thoſe in which their iſſues are ſeparate, or even diſtant, as the aplyſia. Under the firſt are included the ſnail, ſlug, teſtacella, parmacella, doris, tritonia, and many univalves.

The ſlug may be deſcribed firſt, as being the moſt ſimply organized: it has only the organs common to the whole claſs; *viz.* an ovary, oviduct, teſticle, vas deferens, penis, and bladder with a long neck.

The ovary is ſituated towards the back part of the body, between the lobes of the liver and the inteſtines. It forms a very complicated congeries, like a bunch of ſmall grapes, of which each grain is an ovum, while the pedicles are tubes uniting together, and ending at laſt in the oviduct. The latter forms many zigzags, and adheres ſo cloſely to the teſticle, that it may eaſily be ſuppoſed to penetrate its ſubſtance, and receive the ſecreted fluid; but this is not the caſe. Having followed the whole length of the teſticle, become obviouſly larger, and even during the ſeaſon of copulation ſwollen and plaited, the oviduct terminates in the bottom of the common cavity of generation.

The teſticle is a white oblong gland, very large, particularly at the ſeaſon of propagation. It may be divided into two parts: the poſterior, behind the junction of the oviduct is oval, and ſwells moſt at the time juſt mentioned. The anterior is oblong. Its ſtructure does not ſo much conſiſt of filaments, like that of the cuttle-fiſh, as of grains. It produces an excretory canal, which opens at the bottom of the penis.

The latter is a cylindrical fleſhy bag, poſſeſſing internally a prominent ridge in its whole length, and opening into the common cavity of the generative organs. It can be everted like the finger of a glove, and be extended by means of its own fibres, and withdrawn to its original poſition by a retractor muſcle ariſing from the back of the animal, and inſerted in the point of the bag, near the vas deferens. When this bag is unfolded, and is protruded externally, it forms a projecting penis, the internal ridge being unfolded ſo as to make the internal ſurface ſufficiently broad to become external. The orifice of the vas deferens is now found on the very point of the penis, having been before at the bottom of the bag.

The bladder with the long neck, making the third principal organ, was called by Swammerdam the reſervoir of the purple, believing that the murex formed in an analogous part the celebrated colouring matter of the ancients. This is not the caſe; though the real uſe of the part in queſtion is not known. It ſometimes contains, both in the ſlug and ſnail, a concrete reddiſh-grey ſubſtance: at other times merely a liquid. It is found in all gaſteropoda, and may poſſibly be concerned in producing a fluid to cover the eggs.

The common cavity of generation is a fleſhy ſac, in which the three preceding organs terminate, and which has an external opening under the right ſuperior horn.

When ſnails copulate, they evert this ſac, which then preſents three openings; *viz.* of the oviduct, bladder, and penis. The latter quickly comes out of its opening, and enters the oviduct of the other individual. In this way copulation is effected: the laying takes place ſome days after.

The intimate connection between part of the oviduct and part of the teſtis and vas deferens, deceived Swammerdam concerning the nature of theſe organs. He firſt conceived

 the

the testicle to be the ovary: having afterwards found the true ovary, he called the testis the bag of glue. The large part of the oviduct adhering to the testis he called the uterus; and not seeing that the vas deferens belongs exclusively to the testis, and has only an external attachment to the oviduct, he admitted a communication between the uterus and penis.

The size of the penis varies in the different species of snails: some have it longer than the body, when extended.

These organs in the testacella do not differ remarkably from those of the snail.

The ovary of the tritonia is more voluminous, the oviduct larger in proportion, and the testicle irregularly lobed and shaped like a ball.

In the doris, the oviduct, after joining the testis, appears to unite with the canal of the bladder, and to form with it a common canal. In the doris solea, from the Indian seas, it seems even to enter the bladder itself; which would confirm the notion of this part being designed to furnish a covering for the ova. The testicle is rounded, and touches the common cavity. A small accessory bladder is connected to the canal of the bladder.

In the bulimus stagnalis (helix, Linn.) the connection between the oviduct and testicle is not so close. The vas deferens can be distinguished throughout, at first large and expanded into a reservoir much plaited, and capable of containing a large quantity of fluid. At passing out, the canal is small, enters the flesh near the end of the oviduct, then comes out again to end in the bottom of the sac of the penis, which is organized as in the slug.

The ovary and testicle of the snail are arranged as in the slug. The neck of the bladder is much longer, and connected to the broad portion of the oviduct, as far as the point of its union with the testicle. The lower part of its neck is broad, and receives the orifice of the oviduct. It moreover receives the apertures of two parts, which do not exist in the slug; *viz.* two ramified organs, each of which terminates in fifteen or twenty small cæca, containing a white milky liquor. This might be considered as seminal fluid, and the organs as vesiculæ seminales, but they have no immediate connection with the vas deferens. The latter terminates in the side of the penis, near its entry into the common cavity. The penis therefore is not perforated at its bottom, as in the slug: it is also much longer; but probably it cannot be unfolded in its whole length, perhaps only as far as the point at which the vas deferens enters: this would then become its external extremity.

The snail has another remarkable part, not found in the slug; *viz.* the sac of the dart. It is oblong, with thick muscular parietes: at the bottom there is a papilla, from which proceeds a pointed dagger-shaped dart, with four cutting edges. The substance of this singular part is calcareous: it is renewed when lost. Snails prick each other with it, at any part of the skin indifferently, when they are about to copulate. They seem too to dread it; for as soon as one perceives the other's dart, he withdraws immediately into the shell. The object of such a proceeding cannot be conjectured. Copulation does not take place, until after both individuals have brought out their darts: it resembles that of the slug.

The length of the penis protruded in copulation, and the number of cæca, vary in the different species of snails.

The parmacella has the same organs as the snails. Its vesiculæ are oval and undivided, and terminate directly in the common cavity. The sac of the dart is nearer to the prepuce of the penis; and the vas deferens opens in the bottom of the latter.

The second section of hermaphrodite gasteropoda includes those, in whom the penis passes out at some point of the body distant from the oviduct. The vas deferens is still united to the oviduct, and communicates with the penis only by the intervention of a groove excavated in the external surface of the body. This groove is on the right side of the neck in the aplysia; under the right edge of the cloak in the onchidium, &c.

The ovary of the aplysia is an oval mass, occupying all the posterior part of the abdomen, and in its ordinary state of a whitish colour. The oviduct arises from it by several vessels, coming from the different parts of the mass, like the excretory tubes of a gland, and uniting into one canal. The latter, having run along the right side of the testicle, suddenly becomes smaller, turns round the apex of that gland, and forms a canal which, having been closely joined for some time to the vas deferens, terminates by opening in it, after receiving a small blind intestine, apparently analogous to the ramified organs of the snail.

The testicle is of a beautiful yellow, and resembles an elliptic spheroid surrounded by a spiral band. Its middle is tolerably compact, and seems nearly homogeneous. The spiral band is itself divided into a principal finely striated band, of which the striæ are probably so many vessels, and two smooth borders, which are excretory tubes. The superior is the vas deferens common to the whole testicle, serving to convey the seminal fluid.

The common cord going to the exterior of the body is at first divided into two canals. That which comes from the testis is formed of a thin membrane much plaited: the other, from the oviduct, has thicker parietes. From the first third of their length they communicate freely by means of a slit: yet the distinction between them is marked by a projecting membranous septum. The oval bladder opens, towards the second thread, by a small particular duct. Beyond this orifice, the double canal forms a prominence, visible externally, on the right side of the body: its opening is continuous with a deep groove formed in the right side of the neck, and continued into the body of the penis. Does this groove conduct the seminal fluid of one aplysia into the body of another? The solution of the mode of fecundation in these animals depends on the answer to that question.

The onchidium resembles the aplysia in the separation of the organs. The oviduct, after being joined to the testicle, is united to the canal of the bladder, near its neck; and the common canal goes out at the same point as the vas deferens. From their orifice a groove extends, on the right side, along the under part of the cloak, to that of the penis situated at the right side of the head. The latter communicates first with a cavity having two cul-de-sacs. In the bottom of one of them a cylindrical tube enters, which traverses an elliptical muscular enlargement, and extends beyond it to a length more than five times that of the body. Near its entrance into the cavity, this tube conceals a sharp horny point. The other cul-de-sac receives the end of a tube shorter and much slenderer than the preceding, without any enlargement. This has also a small horny point in the corresponding situation. The use of these organs is not known.

The oviduct is distinct throughout from the testicle and the canal of the bladder in the bullæa, although the three organs have their issue at the same point. There is also an accessory vesicula, coming out with them, and a smaller one ending

ending in the oviduct. The penis forms a tube nearly as long as that of the onchidium, but without any enlargement or acceffory tube.

The openings of the fexual organs are remote from each other in the hyalæa and pneumodermon, although united in the fame individual; but the animals are too fmall for a detailed defcription.

Gafteropoda with feparate Sexes.—This feparation certainly exifts in the buccinum undatum. The male is recognized, even externally, by a flefhy penis as large as a finger, compreffed, broader at the end, and terminated by a fmall tubercle, which is perforated by the orifice of the vas deferens. It adheres to the right fide of the neck, and folds back into the pulmonary cavity, but the animal often extends it, without any intention of copulating. The vas deferens traverfes its whole length, making feveral folds and zigzags; it enters the right fide of that part of the body which fills the fhell, makes a large packet of tortuous turns, becomes gradually fmaller, and ends at the tefticle, a yellowifh, foft, glandular mafs, occupying with the liver the higheft turns of the fhell.

Nothing fimilar to this penis is found in the female; the neck is fmooth, but on the right fide of the pulmonary cavity, between the body and the rectum, a large canal is feen, the extremity of the oviduct. The orifice is fmall: on opening it we find a large tube with thick glandular parietes, calculated no doubt to furnifh an exterior covering for the ova. It opens a little within the edge of the pulmonary cavity by a fmall aperture.

In the murex tritonis, there is a fimilar feparation of fexes, and a penis equally flefhy and prominent. Inftead, however, of having a complete vas deferens in its interior, there is a fimple groove on the furface, continued on the body, as far as the portion which fills the fhell. The penis is proportionally fhorter and thinner than in the buccinum. The female has an oviduct fimilar to that of the female buccinum.

The ftrombus has a mere tubercle projecting flightly at the right fide of its very fmall foot. The feminal fluid is conveyed to it alfo by a groove.

The penis of the voluta is flefhy, conical, always projecting, but not perforated: the femen arrives by a groove, which however ends at its bafis, without going to the point.

In thofe genera with feparate fexes, the oviduct is wanting when there is a penis with its groove; this groove occupying the place of the oviduct.

There is an hermaphrodite fpecies; but it feems formed rather on the model of thofe juft defcribed, than on that of the fpecies in the former divifion. It is the helix vivipara of frefh water. It has an oviduct and a groove, placed fide by fide, and ending refpectively at the ovary and tefticle. The latter is clofely joined to the oviduct: its groove terminates externally at the very edge of the foot, under the right horn; and there is no penis but the prominence which this edge may form when extended. The oviduct is of great fize and length when filled with fmall living individuals.

This animal is ovo-viviparous. In the upper part of its oviduct we find eggs not hatched, refembling fmall globules of a whitifh glairy matter, in which with a glafs the animal can be feen covered by its fhell. In thefe ova the fmall pedicle may be ftill feen, by which they were attached to the ovary.

The *acephala* are all hermaphrodites, and impregnate themfelves without any copulation. We difcover no other generative organs but an ovary, extending over the two fides of the body, immediately under the fkin, penetrating between the tendons of the mufcles, and fometimes between the two membranes of the cloak. The fize and colour vary according as the animal is more or lefs advanced in geftation. At a certain period a milky liquor is feen in it, which is probably a feminal fluid defigned to fecundate the ova. When the latter are advanced, they pafs into the fpaces between the two vafcular laminæ, compofing each of the four plates of the branchiæ, and fometimes diftend them in an extraordinary manner, for the number is truly prodigious in fome fpecies. The eggs of the ovo-viviparous fpecies, as the frefh-water mufcle, are hatched in the branchiæ. When we obferve the little mufcles with a glafs, we fee them open and fhut their valves with great activity.

No orifice has yet been difcovered, by which they could pafs out; probably they efcape by lacerating the tiffue at the edges of the branchiæ between their pulmonary veffels.

The organs of generation in the naked acephala, as the biphori and afcidiæ, and in the branchiopoda, as the terebratulæ and lingulæ, have not been carefully inveftigated.

The cirropoda, or balani and anatifæ, differ very much from the acephala, and approach in their male organs, as in feveral others, to the cruftacea. On each fide of their inteftinal canal there is a white ferpentine tube, fuppofed to be the tefticle, and ending towards the bafis of the rectum. Yet thefe animals are hermaphrodites, and their ovaries are two maffes placed between the trunk and the cloak, and connected in their fituation only by veffels and cellular tiffue.

Generative Organs of Worms.—This clafs exhibits the three combinations, which are found in the mollufca; fome have the fexes feparate; others united, fo that they fecundate themfelves in an infulated manner; in a third divifion they are united, but there is a reciprocal copulation.

The leech exemplifies the latter modification; it has a very confiderable penis, compofed of a thick and long mufcular tube, hollow internally, which can be protruded like the penis of the fnail, while it is prolonged backwards into a flender and merely membranous tube. There are two tefticles, each compofed of numerous convolutions of a fingle, foft, whitifh canal, with glandular fides, and of a fhort, ftraight, and mufcular vas deferens. Thefe two tubes appear to terminate at the bafis of the mufcular part of the penis, and the feminal fluid probably flows along the grooves of its furface, when it is unrolled. Near it is a cavity opening externally, and ferving apparently to receive the penis of the other individual. The orifices of thefe parts are near each other, and near the anterior extremity of the body.

The earth-worm exhibits two orifices on its under furface, near the anterior extremity, and not, as fome have defcribed, at the fwelling in the middle of the body. They correfpond internally to two or three foft, oval, glandular cavities. There are feveral fmaller ones around them. Thefe feem to be the organs of generation; but we cannot point out their functions. Willis mentions that the large cavities are fometimes filled with eggs; but we fee true ovaries, in the form of fmall inteftines, arranged in three or four pairs, and fwelled by ova, fo as to refemble rows of beads. No external or internal organ of copulation can be found; yet it is popularly known that earth-worms remain clofely embraced for the purpofe of fecundation.

In the anterior part of the body of the lumbricus marinus there are five greyifh facculi on each fide, fufpended by veffels and cellular fubftance, and appearing analogous to thofe of the earth-worm. The ova muft efcape from the facculi

facculi in thefe animals, for we fometimes find the whole body filled with them.

The fame thing is feen in the aphrodite, where the fexes are feparate; in fmall individuals the body is filled with a whitifh milt, while the large ones have it full of fmall ova in all the intervals of the vifcera. If, as it feems probable, there are particular organs for the preparation of thefe fubftances, they have not yet been difcovered or defcribed. The fame obfervation may be extended to the genera nereis, ferpula, and other red-blooded worms.

It is doubtful, whether or no there are diftinct fexes in the inteftinal worms. In the afcaris lumbricoides, the orifice of generation is found in the anterior third of the body: a fmall fhort veffel foon ends in two larger ones, which gradually diminifhing extend to four or five times the length of the body, and are collected in irregular bundles, which may be eafily developed. Thefe tubes, which muft be regarded as ovaries, contain a milky fluid, and an infinite number of fmall ova.

All the echino-dermata feem to be hermaphrodites, and to poffefs the power of fecundating themfelves: their ovaries fill a large part of the body, when they are fwollen in the feafon of laying. They are fometimes feen bathed as it were in a milky liquor, which feems to hold the place of feminal fluid: this may be obferved in the common ftar-fifh, where the ovaries form five large branches, one for each divifion of the body: the eggs are round and reddifh.

The echini, properly fo called, have from five to ten confiderable ovaries, reddifh, lying near the furface of the fhell, and ending at the circumference of the anus. They form the eatable portion of the echini.

In the holothuriæ, a collection of numerous ramified fmall tubes is feen near the mouth, amazingly developed at particular feafons, when they are filled with a reddifh powdery matter, fometimes collected in globules. Thefe parts feem to be the ovaries; but we fee alfo, near the anus, numerous whitifh filaments, refembling worms, and each formed of a flender elaftic thread, turned fpirally, and capable of being unfolded.

The mode of generation in the actiniæ has been defcribed by Reaumur: he ftates that "in producing its young, the actinia inverts its body as it does in rejecting the fhells of animals, which it has fwallowed for food. I have obferved that thefe animals are viviparous, and have feen them come out, perfectly formed, from the body of the mother, as they are reprefented in fig. 25. It is neceffary that the cavity fhould be turned infide out, as we have already defcribed in fpeaking of the digeftive procefs: the young ones then come out of a large tranfverfe fiffure. Although the parent may contain fometimes more than twelve (and this opening is large enough to allow feveral to pafs at once), they come out one by one, and indifferently at all parts of the fiffure. Thefe little actiniæ, before their birth, are placed in the bafis of the parent; and lodged in folds of the membrane." Reaumur, Acad. des Sciences, 1710, p. 477.

The procefs and the organs concerned in it have been defcribed more in detail by Dr. Spix, in the Annales du Mufeum d'Hift. Naturelle, tom. xiii. "The fpace left between the alimentary cavity and the external envelop of the animal is divided," he fays, "into longitudinal cavities by folds of a membrane which lines it, and is analogous to peritoneum. Each longitudinal cavity contains an ovary, and communicates with two or three tentacula. Each ovary is compofed of three or four cylindrical and united tubes, joining together at their bafis into a common canal, and becoming flenderer towards the apex in proportion as the eggs become fmaller, of which each ovary contains about fixty. The common tubes of two neighbouring ovaries join into one, and this latter again joins the common tube of the two next ovaries. The oviduct thus formed belongs therefore to four ovaries, and terminates in the bottom of the ftomach. This is the only point at which the young can come forth: hence all obfervers have found them in the ftomach, without knowing how they came there. The eggs are round, yellow, and fimilar to grains of fand. The actiniæ are viviparous, according to the obfervations of Reaumur, Ellis, and Dicquemarre, with which my own agree. I have often feen the young come out of the mouth, of a form perfectly fimilar to that of the mother. An actinia, which I have in fpirits of wine, contains a great number of eggs marked with an opaque point, and apparently containing the embryo animal. I have even an individual about the fize of a hempfeed, which feems to quit its covering with difficulty, and whofe mouth and tentacula are not yet diftinct." P. 448. pl. 33.

The multiplication of polypes and zoophytes by buds or fhoots is well known: this feems to preclude the exiftence of a particular organ of generation. Yet the author juft quoted, has defcribed and figured parts which he confiders as generative organs in a fpecies of alcyonium. See his Memoir and plate as above.

Peculiar Secretions.—The *inky fluid* of the fepiæ is produced in a membranous bag, exprefsly deftined to that office. The fecreting organ is a villous furface, with fine and long proceffes, adhering to one of the fides of the bag. The fecretion is a very thick black fubftance; but its particles are fo minute, that it admits almoft of infinite dilution, and a fmall quantity will tinge a vaft volume of water. This matter, when removed and dried, forms the colour named fepia by the painters; that of the common cuttle-fifh is a black-brown. The octopus has it blacker; and the Indian ink which comes from China is certainly nothing more than the produce of fome fepia of that country, fo that it is ufelefs to attempt imitating it by artificial mixtures. Chemical analyfis has difcovered in it a very minutely divided carbonaceous matter, mixed with animal gluten.

The ink-bag of the octopus is enveloped by the lobes of the liver, which has given rife to the erroneous idea of fome moderns, that this part is analogous to the gall-bladder, and that the fluid is a biliary fecretion.

It is in front of the liver in the calmar, but free, and not inclofed in its fubftance. In the cuttle-fifh it is much more deeply placed, before the inteftines and the intermediate heart.

In all cafes, its excretory duct terminates near the anus, pouring its liquor into the funnel, which is the general receptacle for all the excretions.

The *purple* matter, fo celebrated among the ancients, is produced by feveral different gafteropoda: poffibly, however, fome fpecies may furnifh it of a more beautiful or durable kind. It tranfudes in fome of the genus murex from the edges of the cloak; fo that it is no doubt produced in them as in the aplyfia, of which the organ will be defcribed. Swammerdam fufpected that the fac, adhering to the organs of generation, and defcribed by the indefinite term of bladder, was the refervoir of the purple; but this fufpicion does not feem well founded.

In the aplyfia the operculum of the branchiæ is analogous to the cloak of other univalves, and differs from it only becaufe the fhell does not entirely fill it. The edge is occupied, in all parts to which the fhell does not extend, by a fpongy fubftance, of which all the pores are diftended by the purple matter. This is fo thick, that when it is ex-

preffed without being diluted, its colour is a black violet; but it gives water the tint of claret wine. A fingle aplyfia is capable of colouring in this way feveral buckets of water.

In fpirits of wine this liquor becomes of a deep green. Some naturalifts reprefent that the colouring liquor of certain animals of the genus murex comes out of the body green, and changes to purple by the action of light But it may be fqueezed out of the murex brandaris of a perfect violet colour.

Spinning Organs (*Filières*) *of acephalous Mollufca.*—The mufcles of falt-water (mytilus), the limæ (oftrea lima, Linn.), pernæ (oftrea, Linn.), aviculæ, and pectines, are fixed to rocks by means of threads, which they make themfelves. Thofe of the pinna are the moft celebrated, for they have been actually employed in manufactures.

The matter, of which the threads are formed, is produced by a conglomerate gland, concealed in the body under the bafe of the foot. The latter, which has more or lefs refemblance to a tongue, with a groove along its under furface, feizes the vifcous matter at the orifice of the excretory tube, draws it out, and models it in the groove. It fixes the end, ftill foft, to a rock, and returns to the orifice, to find the materials of another. Reaumur has minutely defcribed the procefs, in the Memoirs of the Royal Academy of Sciences for 1710, from which we have taken the following particulars.

"From the root of this kind of tongue, or the part where it is attached to the body of the animal, feveral threads are obferved to proceed to fome neighbouring fixed object, and thus attach the animal in its fituation. They are about equal in fize to a pig's briftle; vary in length from one to two inches, and pafs out of the fhell at the part where it naturally opens. Stones, fragments of fhells, and very frequently the fhells of other mufcles, are the objects to which they are fixed: hence we often find large affemblages of thefe animals adhering together. I have fometimes reckoned more than 150 threads employed in faftening a fingle mufcle: as they take different directions, we may regard them as fo many cables keeping the animal firmly anchored.

"Having detached feveral, I inclofed them in boxes, and put them in the fea: in a few days, they were attached to the fides of the veffel, and to each other. I placed others in veffels of fea-water, and obferved their proceedings. In a fhort time they opened their fhell, and thruft out the part already defcribed, which I have compared to a tongue. They elongated and then fhortened it, and thus ftretched it out farther: they would at laft extend it to two inches in length, and then feel about with its extremity, as if to reconnoitre the ground. After thefe preludes, they fixed it for a time in one fpot, and then withdrew it quickly, carrying it back completely into the fhell. I now difcovered that they were fixed to the fpot by a thread. The repetition of this manœuvre multiplied the threads, until they were fufficiently numerous to faften the animal. The new threads thus formed were whiter and more tranfparent than thofe which had exifted for fome time." P. 114, et feq.

When a thread has been formed, the animal feems to try its ftrength, and fometimes it gives way. They will fix themfelves to the furface of glafs. They do not form more than four or five threads in a day. P. 122.

M. Reaumur could not difcover whether they have the power of detaching themfelves, after being once fixed. The youngeft mufcles fpin thefe threads, fuch even as are fmaller than millet feeds. The threads give way in time, either from the repeated fhocks to which they are expofed, or from an alteration in their texture by time. P. 123.

The pinnæ are very large animals, the valves of their fhells meafuring one or two feet, attached to rocks, &c. in a manner fimilar to that of the mufcles, except that the threads are longer and more numerous. They almoft equal, in finenefs and beauty, the filk fpun by the filkworm: hence the French name of coquille porte-foie, and the ancient name of barba byffina applied to this production, which has been generally called the *beard* of the animal. It has actually been manufactured in Sicily, and other parts of the Mediterranean, into gloves and other articles, which exactly refembled filk. As the individual threads are fo fine, their number is immenfe. Ibid.

In the Memoirs for 1717, Reaumur fpeaks at greater length of the pinna or jambonneau, and the filk threads which attach the animal to furrounding objects. Thefe animals are fifhed in the Mediterranean, in from fifteen to thirty feet of water. The tuft of filk is attached, as in the mufcle, immediately to the animal's body, and paffes between the two valves, at four or five inches from the fmall end of the fhell, in large pinnæ. As they are torn up with an iron hook, you cannot be fure of feeing the whole length of the faftening; but Reaumur has found it feven or eight inches long, and weighing three ounces. The fpinning organ is about two inches long in the dead animal, and muft admit of extention to fix or feven inches in the living, to form threads of the length we meet with. The end of the filk paffes into a conical bag, which contains four membranous plates, and an equal number between them of thin filk plates, made of fine filk intricately interwoven. The filk faftening of the animal is fecured to the latter. Obfervations fur le Coquillage appellé Pinne marine, ou Nacre de Perle, &c.

On the fubject of the remarkable power, poffeffed by many animals of the lower orders, particularly in the genus medufa, of producing light, fee the article LIGHT.

The fource of that fingular property, which many medufæ poffefs, of imparting a burning fenfation to the fkin, like that produced by the common nettle, (whence their names of urtica marina, fea-nettles, &c.) is not known. It may be in fome fluid fecreted by the animal.

We may obferve, in general, of all the fecretions in the lower orders, including the purple matter and filk, the biliary fluids, the luminous and ftinging particles, the calcareous matter of fhells, &c. that they are produced in ftructures much lefs complicated, and in animals much lefs perfectly organized, than the analogous products of the vertebral divifion.

We cannot pretend to give a complete enumeration of the works, from which information may be derived on the fubject of the preceding article; but we fhall mention a few of the moft important.

On the anatomy of the lower orders, fcience is moft deeply indebted to the learned, acute, and indefatigable Cuvier, who has contributed more than all others together to our accurate knowledge of thefe claffes. His "Leçons d'Anatomie comparée" contain the refults of moft of his labours; and the greater part of our defcriptions is derived from that work. He has alfo publifhed numerous excellent papers, accompanied with very beautiful and valuable engravings, on the anatomy of feveral genera of mollufca, in the Memoires du Muféum National d'Hiftoire Naturelle. They are as follow:

Memoire fur l'Animal de la Lingule (Lingula anatina, Lamarck); tom. i. p. 69.

Memoire fur la Builæa aperta (Lamarck), Bulla aperta (Linn.); tom. i. p. 156.

Memoire fur le Clio borealis; tom. i. p. 242.

Memoire

Memoire sur le Genre Tritonie, avec la Description et l'Anatomie d'une nouvelle Espèce, Tritonia Hombergii; tom. i. p. 480.

Memoire sur le Genre Aplysia, vulgairement nommé Lievre marin, sur son Anatomie, et sur quelques unes de ses Espèces; tom. ii. p. 287.

Memoire concernant l'Animal de l'Hyale, un nouveau Genre de Mollusques, intermediaire entre l'Hyale et le Clio, et l'Etablissement d'un nouvel Ordre dans la Classe des Mollusques; tom. iv. p. 223.

Memoire sur les Thalides (Thalia, Brown), et sur les Biphores (Salpa, Forskaohl); tom. iv. p. 360.

Memoire sur le Genre Doris; tom. iv. p. 447.

Memoire sur le Limace (Limax, Linn.), et le Colimaçon (Helix, ejusd.); tom. vii. p. 140.

Memoire sur le Limnée (Helix stagnalis, Linn.), et le Planorbe (Helix cornea, Linn.); tom. vii. p. 185.

Memoire sur l'Onchidie, Genre de Mollusques nus Voisins des Limnées, et sur une Espèce nouvelle, Onchidium Peronii; tom. v. p. 37.

Memoire sur la Phyllidie et sur le Pleurobranche, deux nouveaux Genres de Mollusques de la Famille des Gastéropodes, et Voisins des Patelles et des Oscabrions, dont l'un est nu, et dont l'autre porte une Coquille cachée; tom. v. p. 266.

Memoire sur la Dolabelle, sur la Testacelle, et sur un nouveau Genre de Mollusques à Coquille cachée, nommé Parmacelle; tom. v. p. 435.

Memoire sur la Scyllée, l'Eolide et la Glaucus, avec des Additions au Memoire sur la Tritonie; tom. vi. p. 416.

Memoire sur l'Ianthine et la Phasianelle de M. Lamarck; tom. xi. p. 121.

Memoire sur la Vivipare d'Eau douce (Cyclostoma viviparum, Draparnaud; Helix vivipara, Linn.), sur quelques Espèces voisines, et Idée générale sur la Tribu des Gastéropodes pectinès à Coquille entière; tom. xi. p. 170.

Memoire sur le grand Buccin de nos Côtes (Buccinum undatum, Linn.), ainsi que sur les Buccins, les Murex, les Strombes, et en général sur les Gastéropodes pectinès à Syphon; tom. xi. p. 447.

Memoire sur le Genre Tethys, et son Anatomie; tom. xii. p. 257.

Memoire sur les Acères, ou Gastéropodes sans Tentacules apparens; tom. xvi. p. 1.

Sur les Ascidies, et sur leur Anatomie, Memoires du Muséum d'Histoire Naturelle; tom. ii. p. 10.

Sur les Animaux des Anatifés et des Balanes, Lamarck (Lepas, Linn.), et sur leur Anatomie; ibid. p. 85.

We may refer also to Péron, sur le nouveau Genre Pyrosoma, Ann. du Mus. tom. iv. p. 437.

Péron et Le Sueur sur les Meduses du Genre Equorée, tom. xv. p. 41; et Histoire de la Famille des Mollusques Pteropodes, p. 57.

Spix Memoire pour servir à l'Histoire de l'Asterie rouge (Asterias rubens, Linn.), de l'Actinie coriacée (Actinia coriacea, Cuv.), et de l'Alcyon exos; Ann. du Mus. tom. xiii. p. 438.

Mery, Remarques sur la Moule des Etangs; Mem. de l'Acad. des Sciences, 1710.

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Goeze, Versuch einer Naturgeschichte der Eingeweidewürmer thierischer Korper, 1782, 4to.

Werner, Vermium Intestinalium præsertim Tæniæ humana brevis Expositio, 1782, 8vo.; with three continuations, 1782, et seq.

Rudolphi Entozoorum Historia, 2 vols. 8vo.

Müller, Zoologia Danica, fol.

Müller, Von würmern süssen und salzigen Wassers, 4to.

Pallas, Miscellanea Zoologica et spicilegia Zoologiæ.

Swammerdam, Biblia Naturæ.

Lister, Exercitationes Anatomicæ.

Since this article was finished, new and valuable sources of information on the subjects comprehended in it have been opened to the public. Under this head we may enumerate Cuvier Histoire et Anatomie des Mollusques, 4to. 1817, containing all the memoirs specified above, and some new ones, particularly one on the cephalopoda.

Cuvier, Regne Animal, 4 tom. 8vo.

Savigny, Sur les Animaux sans Vertebres, part 2.

Lamarck, Sur les Animaux sans Vertebres, 2d edition, greatly enlarged.

Blainville, various memoirs on the Mollusca, published in the Bulletin des Sciences, 1814—1817.

Tiedemann, Anat. der Holothuria, des Seesterns, et des See-igels; fol. Landshut.

VERMICELLI, or VERMICHELLI, a kind of mixture, prepared of flour, cheese, yolks of eggs, sugar, and saffron; and reduced into little long pieces, or threads, like worms, by forcing it with a piston through a number of little holes in the end of a pipe made for the purpose.

The word, in the original Italian, signifies *little worms*: they also call it *tagliarini*, and *millefanti*.

It was first brought to us from Italy, where it is in great vogue. In effect, it is the great regale of the Italians. Other nations are not easily brought to relish the taste of it. It is chiefly used in soups and pottages, to warm, provoke venery, &c.

VERMICULAR, an epithet given to any thing that bears a relation or resemblance to worms, *vermiculi*.

Anatomists particularly apply it to the motion of the intestines and certain muscles of the body.

The *vermicular*, or *peristaltic*, motion of the intestines is performed by the contraction of the fibres thereof from above downward; as the unnatural, or antiperistaltic motion, is by their contraction from below upwards.

The contraction happening in the peristaltic, which others call the vermicular motion, as resembling the motion of worms, does not affect all the parts of the intestines at once; but one part after another.

VERMICULAR, or *Vermiculated Work*, *Opus vermiculatum*, in *Sculpture*, a sort of ornament, consisting of frets, or knots,

knots, in Mosaic pavements, winding, and representing, in some sort, the tracks made by worms:

"Quam lepide lexeis compositæ, ut tesserulæ omnes
Arte pavimento, atque emblemate vermiculato."
Cic. de Orat. lib. iii.

VERMICULARIA, in *Botany*, from *vermiculus*, a little worm, so named by Tode, on account of the arrangement of the seeds.—Tode Fung. Mecklenb. v. 1. 31. Pers. Syn. Fung. 110.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eff. Ch. Capsule globose, sessile, filled with vermicular bodies, covered with seeds.

This genus appears to have been seen only by the lynx-eyed author of the *Fungi Mecklenbergenses*. Persoon has adopted it from him. Three species are all that we find described.

1. V. *pseudosphæria*. Black Granulated Vermicularia. Tode n. 1. t. 6. f. 46. Pers. n. 1.—Globose, aggregate. Capsule granulated, black. Seed-bearing filaments loose, naked, white.—On rotten oak-bark in March, found but once. The *capsule* is not larger than a grain of sand, slightly compressed, tender, not brittle as in *Sphæria*; full of short, flexible, crowded fibres, covered all over with extremely minute white *seeds*. Afterwards the fibres turn orange-coloured.

2. V. *pubescens*. Downy Vermicularia. Tode n. 2. t. 6. f. 47. Pers. n. 2.—Globose, scattered. Capsule downy, two-coloured. Seed-bearing filaments loose, naked, hoary.—Found in rainy weather, in July, on dry stalks, or dead branches. The size of cabbage-seed, of a deep orange-colour, covered with white cottony down. *Fibres* very slender, crowded together.

3. V. *hispida*. Hispid Vermicularia. Tode n. 3. t. 6. f. 48. Pers. n. 3.—Cushion-like, scattered. Capsule black, beset with bristles, which disappear from its summit. Seed-bearing filaments whitish, loosely immersed in meally pulp.—Found but once, on rotten elder-wood, in April. This is no larger than the first species. The *capsule* is orbicular, depressed; when young bristly all over; but at length the centre shows itself quite bare, very smooth, never bursting, slightly wrinkled as it advances in age. The fibres, though unconnected with any other part, are imbedded in rather soft pulp, which is peculiar to the present species.

VERMICULARIS. See Ascaris.

Vermicularis *Crusta*, a term used by some anatomical writers to express the internal hairy and corrugated coat of the intestines.

VERMICULI Spermatici. See Generation.

VERMICULUM, a word used by some chemists to express a tincture or elixir.

VERMICULUS Marinus, the *Sea-worm*, in *Natural History*, the name of a genus of shell-fish.

These shells are called vermiculi, sea-worms, from the fish contained in them, which is always a sort of worm. They usually are found in great clusters together, interwoven oddly with one another.

Bonani calls them sea-serpents, inclosed in shells, from the various twisted forms in which they adhere to ships and rocks. The author establishes them among the multivalves, because they are never found single, but always in these clusters. In this sense he looks upon the whole cluster as the shell-fish under consideration, not any one of the single tubes; though he acknowledges that each of these tubes is a perfect shell, independent of the rest, and has its proper inhabitant. Strictness in natural history, therefore, would not bear him out, in arranging them among multivalves; for they are certainly an univalve shell, though many of them happen always to be found together.

Care must be had not to confound these with the dentalia and entalia; for these last are always found single; and the vermiculi, of the kind here treated of, are always found together in great numbers, forming clusters of ten inches, and often much more in diameter.

Of the vermiculi, which are straight, we have eight species; of the crooked kind, we have four species; and of those which are disposed in a sort of circles, we have nine species. Hist. Nat. Eclair. p. 354.

According to Da Costa's arrangement, the vermiculi or worm-shells constitute the third family of univalve shells: and he defines them to be tubular cylindric shells, single, in masses together, or adherent to other shells or bodies; variously sinuous, by winding or twisting to and fro in a very irregular manner. Of these vermiculi he reckons two genera, viz. those which have no fixed or regular form, as the common vermiculi, of which, though they are found in great abundance, there are not many different species; and the penecilli or worm-shells, which, in the whole, or any particular part, have a determinate regular shape or structure. There are few species of this genus; the watering-pot from the East Indies is the chief kind, and, when perfect, is much valued. There are also vermiculi which have concamerations, or are divided into chambers by a few or many transverse plates; but they are seldom regular, or set at equidistant intervals, and not pierced by a pipe or siphunculus, communicating from chamber to chamber, so as to permit the fish to penetrate more than one chamber or inclosure at a time; in which respect they differ from the concamerated shells, as the nautili, &c. The vermiculi are frequently found in the fossile state; but there is no species, that is not known recent, or from the sea. Da Costa's Conchol. p. 148. See Conchology.

VERMIFORMIS *Appendix Cæci*, in *Anatomy*, a small blind process connected with the cæcum. See Intestine.

Vermiformis *Processus*, of the cerebellum. See Brain.

VERMIFUGE Substances, in the diseases of animals, are all such as are found capable of destroying or expelling insects or worms from their bodies. They are of many different sorts, as those of savin chopped fine, antimony, calomel, and many others. See Worms.

VERMIFUGUS, the same with *anthelmintic*. See Worm-*Seed*, and *Worm*-Powders.

VERMILION, a bright, beautiful red colour; in great esteem among the ancients, under the denomination of *minium*.

There are two kinds of vermilion; the one *natural*, the other *factitious*.

The *natural* is found in some silver mines in form of a ruddy sand; which they prepare and purify by several lotions and coctions. When this is used as a colour, no other preparation is necessary than a careful levigation with water on a stone.

The *factitious* or *common* is made of artificial cinnabar, ground up, as some say, with white wine, and afterwards with the white of eggs: in this state it is made into cakes, and left to dry. And to fit it for use, they grind it up a second time with water, and whites of eggs. To purify and heighten its colour, some grind it up with urine, or spirits of wine, to which a little saffron is added.

Some also pretend to make vermilion of lead, burnt and washed; or of ceruss, rubified by fire. But these are not

not properly denominated vermilion, but *red lead.* See MINIUM.

It is this laſt, however, that ſeems to be the artificial minium, or vermilion of the ancients; and, accordingly, apothecaries and painters ſtill give it that name.

The ancient Greek and Latin authors have given divers fabulous accounts of their minium; and ſeveral of the moderns have adopted their dreams; the moſt rational accounts are, that Theophraſtus attributes the firſt invention of making it to Callias the Athenian; who hit upon it in endeavouring to draw gold, by fire, out of a red ſand, found in the ſilver mines, in the year of Rome 249. But Vitruvius ſays, it was diſcovered in the Cilbian fields; where it was drawn from a red ſtone, called by the Greeks *anthrax*.

We have two kinds of vermilion from Holland; the one of a deep red, the other pale; but both are in reality the ſame matter, the difference of colour only proceeding from the cinnabar's being more or leſs ground: when fine ground, the vermilion is pale; and this is preferred to the coarſer and redder.

It is of conſiderable uſe among the painters in oil, and in miniature; and likewiſe among the ladies, as a fucus, or paint, to heighten the complexion of ſuch as are too pale.

VERMILION is ſometimes alſo, though improperly, uſed for what we otherwiſe call *kermes*, or *ſcarlet grain*.

VERMILLION LAKE, in *Geography*, a lake of North America, which extends 6 or 7 miles N.N.W., and by a narrow ſtrait communicates with lake Namaycan, that takes its name from a particular place at the foot of a fall, where the natives ſpear ſturgeon. N. lat. 48° 40′. W. long. 93° 26′.

VERMILLION *Point*, or *Cape Townſend*, a peninſula in lake Michigan, which ſeparates Green bay from the other part of the lake; 23 leagues long, and from 1 to 3 broad.

VERMILLION *River*, one of the principal rivers of Louiſiana, in that part of the ſtate which is called Attacapas, and which is bounded S. by the gulf of Mexico, N.W. by Opelouſas, N.E. by the Atchafalaya, and on the E. by the Atchafalaya and the lakes belonging to that river. This diſtrict forms a ſcalene triangle, whoſe area amounts to 5100 ſquare miles: the actual population, aſcertained by the cenſus of 1810, amounts to leſs than two perſons to the ſquare mile. The Vermillion river, like the *Teche* (which ſee), has its ſource in Opelouſas, and enters Attacapas or Attakapas at the mouth of Carrion Crow; it then runs ſouth about 16 miles, then winds to the weſt, and receives from the ſouth the bayou (creek) Tortua, continues weſt eight miles, paſſes the ridge of hills, (a ramification of which winds along each bank to ſome diſtance,) and aſſumes a ſouth-weſt courſe, which it maintains 25 miles. When it enters the hills, its magnitude juſtifies the title of river, though it has that appellation below the Carrion Crow. The tide in autumn is perceivable thus high, the current of the river being at all times rather gentle. When it has completed its ſouth-weſt courſe, it winds ſouth-eaſt by ſouth 20 miles: the whole length of its comparative courſe in Attacapas being 69 or 70 miles; but the diſtance, purſuing the windings of the ſtream, muſt exceed 100 miles. The two large prairies, known by the names of Opelouſas and Attacapas, extend on each ſide of the Vermillion, from its entrance into Attacapas to its egreſs into the gulf of Mexico. Wood abounds more on the Vermillion than on the Teche; and though the ſoil may be leſs fertile, it is nevertheleſs excellent, and the quantity greater on an equal length of river. There are 80 miles on the banks of the Vermillion, which have an extenſion backwards of two miles, that afford 320 ſuperficial miles, or 204,800 acres. Some of the moſt beautiful ſettlements yet made in the Attacapas are upon this river. From the diverſity of ſoil, and elevation, none can err in giving the preference, with regard to beauty of appearance, to the banks of the Vermillion, before any other river in Louiſiana, ſouth of bayou Bœuf. The lower part of the Vermillion will, without doubt, ſuit the culture of the ſugar-cane; whilſt the whole extent of its banks is well adapted to cotton and corn. The Vermillion, by its union with the gulf, forms the natural communication of its inhabitants with the ſea. At preſent the depth of water through the inlet into the Vermillion will not admit veſſels of very conſiderable burthen. Darby's Geog. Deſcription of the State of Louiſiana, Philad. 1816.

VERMILLION *River*, a river of America, which runs into the Wabaſh, N. lat. 40° 5′. W. long. 87° 40′.—Alſo, a river of America, which runs into the Theakiki, N. lat. 41° 10′. W. long. 88° 40′.—Alſo, a river of America, which runs into lake Erie, N. lat. 41° 45′. W. long. 82° 12′.

VERMILLION *Sea*. See CALIFORNIA.

VERMIN, in *Agriculture*, a collective term which includes all the various ſorts of ſmall animals, that are injurious to the corn, fruit, and other produce of the farmer. The vermin, rats and mice, ſtand foremoſt among thoſe which are the moſt prejudicial. It has been ſtated, that one of the former eats and deſtroys more than a quart of corn, on the average, in the courſe of the week; which amounts to the vaſt quantity of upwards of twenty quarters in the year, for the ſupport of an hundred of them; and this is probably fewer than the number to be met with, in moſt caſes of large corn-farms; ſo that the real damage is perhaps conſiderably more. The injury ſuſtained from the latter is, in all probability, nearly equal to that from the former. The loſſes, on a moderate calculation, cannot be leſs than forty pounds in the year to every large farmer, and half that amount to thoſe of the ſmaller claſs.

In the field, the barn, and the dairy, theſe ſmall vermin are equally diſagreeable, troubleſome, and deſtructive, and are ſuppoſed to be more miſchievous than moles. Much care is beſtowed, it is ſaid, on the deſtruction of moles; and it might be worth while to endeavour to leſſen the number of field vermin of this ſort, which are in their nature, it is contended, more injurious to the farmer than moles are. In the rick-yard, the barn, the dwelling-houſe, and ſome other places too, their miſchievouſneſs is too obvious not to be noticed. In the dairy they not unfrequently commit great injuries, by ſpoiling and deſtroying the different products; and in the harneſs-rooms, and places where ſuch articles are kept, they are not leſs deſtructive, by eating into and gnawing the different articles.

The barn and the ſtack-yard are, it is ſaid, uſually put under the care of the cat: but to ſet a trap for this vermin, in a barn full of corn, has perhaps been conſidered as a thing ſo unlikely to be effective, that it has ſeldom been tried. The ſucceſs of traps, where they have been uſed, has been ſufficient to recommend them; for although a total extirpation of the vermin, in caſes where they have been tried, did not take place, an annual ſaving of ſome quarters of corn has been the conſequence.

It is remarked, that while the number of theſe vermin is great, almoſt any kind of trap may be uſed, provided it be properly baited; but that for taking a remaining artful few, a common ſhaped round ſteel trap, ſuited to the ſize of the vermin, has been found to be the moſt effectual.

In order to the complete extirpation of theſe and other vermin,

vermin, the author of a late Calendar of Hufbandry has, however, advifed that every farm fhould be well provided with a competent number of ferrets, and of true vermin-bred dogs, fuch as are ufually kept for the purpofe; and that an hour or two fhould be fpared weekly, and referved for executing the bufinefs in all acceffible places. The holes and haunts of the vermin, in and about the premifes, are to be diligently fought out and difcovered; trifling rewards being given for the purpofe, as an encouragement, by the mafter. Nothing of a refpite is to be allowed to the delinquents, but a war of extermination is to be conftantly kept up and carried on throughout the whole year. In aid of thefe means, others too may be adopted, when neceffary; as thofe of the trap kind, which fhould be of the cage fort, and not fuch as to endanger the cats, a moft ufeful fort of domeftics, which are fully entitled to care and kindnefs; the qualifications of which in this fituation are, that they do not touch young poultry, and hunt for mere fport, rather than from the impulfe of hunger; as eating their prey injures them, and leffens their exertions. The ferrets in this view are, it is thought, beft kept in huts, in the fame manner as the rabbits: their food is well known to be any fort of offal of the flefh kind, with occafionally a little milk and bread boiled.

The fame means of extirpation and removal apply equally, it is fuppofed, to the field vermin, polecats, weafels, and their different varieties; which, unlefs they be checked, commit fuch frequent confiderable nightly depredations in and about farm-yards, as to become highly injurious, taking away various kinds of poultry in different ftates, and fometimes even young pigs. But it is believed that neither thefe nor the fox would be heard of near fuch premifes, if they were well furnifhed and guarded by vermin dogs.

A good method of trapping field vermin has been propofed by the author of the Rural Economy of the County of Kent, which is this: a wooden box, refembling a dog-kennel, divided in the middle by an open wire partition, running from end to end, and reaching from the ridge of the roof of it to the floor; one fide of which partition is again divided into two parts or cages, one of them for a rabbit, and the other for a live fowl to be put into, to allure the vermin; the other half formed into a falling box-trap to take them in. But it is furely a moft unneceffary piece of cruelty to expofe a poor wretched fowl or rabbit to the fight and claws of their dreaded enemy. Kill the baits, and all is right; as the fcent of the frefh blood is the greateft poffible enticement to fuch vermin.

In regard to vipers, efts, lizards, toads, and different others of any fort of poifonous vermin of the reptile kind, which are troublefome and prejudicial to the farmer, it is fuggefted, that if country-people, who are engaged in this way, would be unanimous and fteady in their endeavours, all thefe forts of creeping little animals might in time be extinguifhed. Would a fingle parifh but make the effort, it is faid, of rooting out all fuch ufelefs and dangerous vermin, they would foon find their account in it, and would undoubtedly be followed by their adjoining diftricts. The only mode is, it is thought, by the allowing of handfome premiums to thofe who fhall produce the vermin, or who may difcover their retreats, hiding-places, or their ova or eggs.

In refpect to the deftructive vermin birds of prey, and thofe of other kinds, it may be noticed, that the former, fuch as carrion-crows, ravens, magpies, kites, hawks, and fome others, chiefly endanger the poultry, fometimes even attack lambs, and are often injurious to difeafed fheep, by picking them in different parts; while the latter, as jays, pigeons, rooks, and different forts of fmall birds, are principally deftructive of field produce. The firft, as well as pies, bull-finches, and fome others, are greatly deftructive of fruit, and the jay often commits much injury on bean-crops near harveft-time. Pigeons are particularly injurious at feed-time and harveft, by deftroying large quantities of grain, tares, and feeds, and doing much hurt to the crops. Rooks are a fort of vermin which do great injury to various kinds of field-crops as they rife, and at other times; but they are thought by fome to be ufeful in devouring the grub-worm and other infects. Small birds do much mifchief by the deftruction of grain which they caufe at the time of fowing, and when the corn becomes nearly ripe; befides that which they, in fome cafes, do to fuch buildings as are covered with thatch. In fome places they quit the towns, villages, and fingle houfes, and attack the corn-fields in flocks of thoufands together, and would foon clear whole fields if not kept off by proper means. Some forts of thefe birds feed upon animal as well as vegetable food, and do good by leffening the number of grubs, caterpillars, and butterflies, and much harm by deftroying bloffoms, fruit, and corn in the fields. Great numbers of caterpillars are faid to have been found in the ftomachs of fome forts of thefe fmall birds. The beft and moft effectual protection againft their injuries and depredations, in all thefe cafes, is probably the gun, though other means, fuch as rattles, and different contrivances, may be had recourfe to againft fuch vermin.

Vermin of the worm, grub, flug, and other fimilar kinds, are often very injurious to the farmer's crops. The earth-worm, the wire-worm, the grub of the cock-chaffer, the flug, the turnip-fly, the black canker caterpillar, the black infect, which deftroys beans, and the yellow maggot, which feeds on the ears of wheat, are of numerous families, and not lefs mifchievous than any of the above vermin. They not unfrequently cut off turnip, clover, tare, and other fuch crops, and do great damage to thofe of the corn-kind. There is a whitifh fort of flug that often prevails much in bean and pea-ftubbles, in ftrong land when fown with wheat, and in wheat after clover and beans. It is very deftructive too to rye-crops in fome diftricts and places. The deftruction of thefe forts of vermin may be attempted in different ways, as by having them devoured, in fome cafes, by the introduction of fuitable birds for the purpofe, and thofe of ducks and gulls in other cafes. It has been ftated that worms and flugs which feed on the new roots of corn, and other fuch matters, may moftly, perhaps, be deftroyed by a clean fallow, continued fo long as to occafion their death by want of food. It is probably a miftaken notion, it is faid, that lime fpread in fuch a quantity as to be beneficial to the foil, will deftroy thefe reptile vermin. In Kent, near the chalk-hills, and even on a calcareous foil, they lime, it is faid, frequently, and very liberally, without being at all relieved from the ravages of worms. The earth-worm feeds on herbs, and as its fize is much larger, fo it is probably more deftructive than the wire-worm. See Black *Canker*, Grub, Slug, Turnip-*Fly*, and Wire-*Worm*.

Vermin of the fly kind, fuch as hornets, wafps, and others, are often prejudicial to feeding and pafturing ftock, and render team animals, in fome inftances, quite ungovernable; they and their nefts fhould of courfe be as much deftroyed as poffible, in order to prevent fuch inconveniences and accidents. See Wasp.

Game may be confidered as a fort of vermin on farms, which feed upon the farmer's crops, and induce and encourage fportfmen to commit much injury and deftruction on

on his property in the purſuit of ſuch field-ſport. This ſhould be avoided and done away with whenever it can, as the damage is very conſiderable in many caſes. See Game.

The able writer of the Corrected Report of the Agriculture of the County of Middleſex has eſtimated, that the expences of guarding againſt, and the damage produced by vermin and game, on a farm of two hundred acres, half arable and half graſs, without ſheep-walks, amount to fifty pounds in the year; which is nearly five ſhillings an acre on the whole quantity of land, which ſum will perhaps, it is ſuppoſed, average the cultivated corn and graſs land farms of Britain; and that, as there are nearly forty millions of acres in this ſtate, theſe depredations amount to ten millions the year. This is an amount which would hardly have been ſuſpected by many, and which it is important in different points of view to prevent as much as poſſible.

Vermin, in *Gardening*, is a term applied to various ſmall animals that are injurious to garden-crops in different caſes, and as deſtructive as in the farm-yard.

Rats and mice are of this kind, and do much miſchief in ſheds and other places, where they frequently deſtroy beans, peas, and other ſeeds; they ſhould therefore be extirpated as much as poſſible in all ſuch caſes.

And there are different modes of deſtroying them in theſe inſtances; as by traps, poiſon, &c. But Mr. Forſyth adviſes never to uſe arſenic, or corroſive ſublimate for that purpoſe, except under particular circumſtances, as they are deadly poiſon: nux vomica will, he thinks, generally anſwer the end as well, without the danger. He has ſuggeſted it as a very good plan to prevent accidents, to encloſe the traps in caſes, having holes in the ends of them large enough to admit rats, but ſmall enough to exclude dogs, cats, &c.

And the following is recommended as a bait for rat-traps in theſe caſes: Take a pound of good flour, three ounces of treacle, and ſix drops of the oil of carraways: put them all in a diſh, and rub them well together till they are properly mixed; then add a pound of crumb of bread. The traps baited with this mixture ſhould be ſet as near their haunts as poſſible; but, for two or three days, ſo as not to fall or ſtrike on the rats going in, but letting them have free liberty to go in and out at pleaſure, as this makes them fearleſs. Some of the bait ſhould alſo be laid at the rat-holes, and a little of it ſcattered quite up to the traps, and ſo on to the bridge of each trap, where a handful may be placed. It may alſo, it is ſuggeſted, be proper to ſcent the traps with the following mixture, for the purpoſe of enticing the rats into them.

Take twenty drops of oil of rhodium, ſix or ſeven grains of muſk, and half an ounce of oil of aniſeed; put them in a ſmall phial, and ſhake it well before uſing; then dip a piece of twiſted paper or rag in the mixture, and rub each end of the trap with it, if a box-trap, and put two or three drops on the bridge, leaving the paper or rag in the trap. Of whatever kind the trap is, it ſhould be ſcented; but once in a twelvemonth will be ſufficient. Then throw ſome chaff mixed with a little wheat about the bottom of the trap, in order to deceive the rats; for they are very ſagacious, and will not enter a ſuſpicious place. This will be neceſſary to be done only at the firſt time of ſetting the traps; for after ſome rats have been caught, and have watered and dunged in them, rats will enter boldly when they find others have been there before them: do not, therefore, waſh or clean out the trap, as ſome people do before they ſet it again, but let the dung and urine remain in it. Keep the places where the traps are ſet as private as poſſible; and when they are ſet for catching, mix no bread with the bait, as the rats will in that caſe be apt to carry it away.

It is adviſed, that when the holes are found quiet, and that no rats uſe them, to ſtop them up with the following compoſition: Take a pint of common tar, half an ounce of pearl-aſhes, an ounce of oil of vitriol, and a good handful of common ſalt, mix them all well together, in an old pan or pot. Take ſome pieces of paper, and lay ſome of the above mixture very thick on them; then ſtop the holes well up with them, and build up the mouth of the holes with brick or ſtone, and mortar; if this be properly done, rats will, he aſſerts, no more approach theſe, while either ſmell or taſte remains in the compoſition.

In order to deſtroy the rats in places where traps cannot be ſet, he recommends us to take a quart of the above bait, then raſp into it three nuts of nux vomica, and a quarter of a pound of crumb of bread, if there was none before: mix them all well together, and lay it into the mouth of their holes, and in different places where they frequent; but firſt give them of the bait without the nux vomica, for three or four ſucceeding nights; and when they find it agrees with them, they will eat that mixed with the nut with greedineſs.

It is further obſerved, that rats are frequently very troubleſome in ſewers and drains. In ſuch caſes, arſenic may be uſed with ſucceſs, as follows: Take ſome dead rats, and having put ſome white arſenic, finely powdered, into an old pepper-box, ſhake a quantity of it on the fore parts of the dead rats, and put them down the holes or avenues, by the ſides of the ſewers at which they come in; this puts a ſtop to the live ones coming any further; for when they perceive arſenic, they will, it is aſſerted, retire immediately: whereas, if they were put down without the arſenic, the live ones would eat them.

We have, however, found that theſe animals take arſenic beſt when it is prepared, by being finely levigated and mixed up with very ſtrong old cheeſe and oatmeal. In order to deſtroy mice, Mr. Forſyth adviſes perſons to take a quart of the bait for rats before there is any bread mixed with it; then to take four nuts of nux vomica, and raſp them very fine, otherwiſe the mice will pick out the food from it, on account of its bitter taſte; rub them well together; lay ſome of it upon a piece of paper, or, if without doors, on a piece of tile, removing all other food from the place, and it will kill all that eat of it. What is not eaten, ſhould be taken away in the morning, and replaced at night. If this be in a garden, ſhelter it with boards or tiles, that it may not get wet.

Open traps ſhould likewiſe be ſet, as mice are ſhy in entering cloſe ones. And care ſhould be taken not to convey theſe animals into gardens by the ſtraw litter, or other ſimilar materials.

Slugs are a ſort of vermin that are frequently found harbouring about the foundations of walls, and about the roots of peas, lettuce, &c. They may, Mr. Forſyth thinks, be picked off, and killed, by putting them into a pot in which is a little fine unſlaked lime: or the ground where they are ſhould be well watered with ſoap-ſuds and urine, mixed with tobacco-water. When they are numerous on the ſurface of the ground, which frequently happens after rain, or in a dewy morning, fine unſlaked lime thrown over the borders, &c. will, he contends, deſtroy them. But he prefers the above mixture, which, if the ground be well watered with it, will bring them up out of their holes, when they very ſoon die; it will alſo deſtroy their eggs, which they always depoſit in the earth.

 Snails,

Snails, also, during the winter, the same writer assures us, gather themselves together in clusters; and in that season are frequently found in great numbers behind wall-trees, and in holes of the walls. They should be carefully picked off and crushed, which is the only effectual way of getting rid of them. If any should escape, they should be destroyed as they make their appearance in the spring. As they also deposit their eggs in the ground, the borders should be well watered in the above manner.

Wasps and flies are highly destructive of all sorts of fruit; therefore, as soon as the wasp and large flesh-fly make their appearance, it is proper to get ready several bottles or phials; then mix up grounds of wine or beer, with sweepings of sugar, honey, or grounds of treacle, and with this mixture fill the bottles half or three-quarters full; then place some of them at the bottom of the wall, and hang a sufficient number up by a piece of yellow willow, or packthread, on the nails against the walls in different places, observing to empty them frequently as they fill with flies and wasps; first pour the liquor into an empty bottle, and then shake out the dead insects, crushing them with your foot, that none of them may revive; then pour back the liquor into the bottles and phials as at first. In this manner a great many may be destroyed, it is supposed, before the fruit becomes ripe. If you begin to hang up the bottles as soon as you see the fly, which comes much earlier than the wasp, you will be able to destroy great numbers of them, and will have the bottles ready for the wasps when they make their appearance. The fly will be found as destructive as the wasp to grapes. And when the weather is hot, and the wasps are numerous, if they do not enter the bottles fast enough (which will happen when the fruit is very ripe), a little oil may be put in a cup, and with a feather dipped in it touch their backs, and they will instantly drop down; when you will find them turned black and green by the effects of the oil. See WASP.

Birds attack fruit much when it begins to ripen. The best preventive in this case is, Mr. Forsyth supposes, to cover the trees with nets, or bunting, a sort of cloth of which ships' colours are made. See VITIS.

There are many other vermin of the insect tribe that are likewise highly destructive to fruits and garden-crops, but which are noticed under the articles which they are found to injure in most cases. In some they may be best destroyed, however, by gathering them by the hand as soon as they begin to appear in a small number, by plentiful steaming or watering; in others, by smoking and powdering with tobacco; and in others by different compositions, as those of soap-suds and sulphur, or lime-water, and other such matters. Some are best taken by artifice, as ear-wigs and others of the same kind, as in the cases of wasps and flies. See CATERPILLAR, APHIS, COCCUS, THRIPS, &c.

VERMIN, in *Sheep*, the different small animals which are troublesome and hurtful to them. The maggots produced from the ova or eggs of the flesh or sheep-fly, are a sort of vermin which are to be particularly guarded against in the later summer months, as they are then soon hatched in any wound, filth, or dirt, that may be in or hang about the skins of them, often producing great pain, uneasiness, and eating into the flesh and destroying the sheep, when not speedily removed. Consequently, when they are seen to be uneasy and disturbed, to frequent rubbing places, neglect their food, lie down frequently, and bite themselves with their teeth, they should be carefully examined; when, in some cases, large blisters may be discovered, under which the vermin are concealed; or the part is found of a dark colour, and quite wet; and even sometimes large holes are eaten into the bodies of the sheep.

In all such cases the wool is to be carefully clipped off, the blisters, when present, opened, and the vermin picked out from the injured parts, which should then be gently washed, either with soap and water, with spirits and vinegar, with lime-water, with stale urine and black soap, or with infusion of tobacco, being afterwards anointed with tar, or the same substance mixed with butter and sulphur or red precipitate. In this way the vermin are soon removed and destroyed, and the sheep restored. In order to prevent the vermin, whenever sheep are wounded by the sheers in clipping, by the bite of dogs, or in any other way, a little tar ointment is to be applied to the parts.

Dirty layers or pastures are said to be liable to produce this kind of vermin, which most commonly attack lambs, and often appear about the hips of such as are affected with looseness.

There are other sorts of vermin which are very injurious to sheep. See TICK.

The fox too is an artful and formidable enemy of sheep and poultry, as well as the wild cat, which is extremely fierce and strong, and very destructive of lambs and fowls. The foumart is also very mischievous among weak lambs. Eagles are likewise frequent in the more northern districts, the strength and depredations of which are well known to sheep-farmers; but ravens are probably more destructive, being ready to attack sheep in all cases of distress, and exceedingly quick-sighted in discovering such instances. All these sorts of vermin should, consequently, be exterminated as much as possible, by offering premiums for their claws, skins, &c. and other proper means of different kinds.

VERMINA. See VERMINE, and VERMINATION.

VERMINATION, VERMINATIO, the act of breeding worms, and other vermin; particularly bots in cattle, &c.

VERMINATION is sometimes also used among physicians, for a sort of tormina ventris, or wringing of the guts; in which the patient is affected, as if worms were gnawing his intestines.

VERMINE, VERMINA, a collective name, including all kinds of little animals, or insects, which are hurtful or troublesome to men, beasts, fruits, &c. as worms, lice, fleas, bugs, caterpillars, ants, flies, &c.

VERMIS, WORM, in *Natural History*. See VERMES and WORMS.

VERMIS *Aureus*. See APHRODITA.

VERMIS *Cæruleus*. See CÆRULÆUS.

VERMIS *Cerebri*, the worm in the brain, a name given by some writers to an epidemical fever in Hungary, attended with terrible deliriums.

VERMIVOROUS ANIMALS, are such as feed upon worms.

VERMONETA, in *Botany*, Juss. Gen. 343, a manuscript name of Commerson's, for a supposed genus of his, referred by Jussieu to their own *Blackwellia*, which we are much disposed to unite with HOMALIUM; see the latter.

VERMONT, in *Geography*, one of the United States of America, situated between 40° 42′ and 45° N. lat. and 3° 35′ and 5° 27′ E. long. from Washington; and bounded on the N. by Lower Canada, S. by Massachusetts, E. by Connecticut river, which divides it from New Hampshire, and W. by New York. Its extent from N. to S. is 152 miles, and its breadth from E. to W. 60 miles: its area is 8700 square miles, or 5,568,000 acres. It is divided into thirteen counties, containing the number of townships and inhabitants,

inhabitants, together with the chief towns, exhibited in the following

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Addison	24	19,993	Middlebury	715
Bennington	16	15,893	Bennington	611
Caledonia	23	18,730	Danville	771
Chittenden	24	18,120	Burlington	804
Essex	14	3,087	Guildhall	685
Franklin	19	16,427	St. Albans	729
Grand Isle	5	3,445	North Hero	82
Jefferson*			Montpelier.	
Orange	20	25,247	Chelsea	745
Orleans	23	5,830	Craftsbury	832
Rutland	27	29,486	Rutland	658
Windham	24	26,760	Brattleborough	786
Windsor	23	34,879	Windsor	898
	242	217,895		

* Laid out since the census was taken.

The number of inhabitants returned in the schedule of Mr. J. Willard, marshal, January 26th, A. D. 1811, is 217,913.

In each township is a reserve of two portions of land, each of 350 acres, one for the support of public schools, and the other to be given in fee to the first minister who settled in the township. An extensive chain of high mountains runs through the middle of this state, nearly S. and N., between Connecticut river and lake Champlain. The natural produce of this chain of mountains is hemlock, pine, spruce, and other evergreens; and on this account, as it has always a green appearance, it is denominated "Ver Mons," or "Green Mountain." On some high parts of it the snow lies till May or June. The country, on the E. side of the mountain, is watered by Paupanhoosak, Quechey, Welds, White, Black, and West rivers; and on the W. side by the La Moille and Onion rivers, and Otter creek, which discharge themselves by one mouth into lake Champlain, 20 or 30 miles S. of St. John's. The adjacent lands are excellent in quality, and annually enriched by the inundation of the water, occasioned by the melting of the snow on the Green mountains. The general aspect of the country is hilly, but it has many rich valleys, which furnish very good pasturage for cattle, and which, contrasted with the hills, afford beautiful scenery. Timber-trees of various kinds are abundant; wheat, rye, barley, oats, Indian corn, are cultivated by the inhabitants: though the corn on high grounds is sometimes liable to be damaged by the frosts. Flax and hemp are raised in considerable quantities: and potatoes, pumpkins, together with garden-roots and vegetables, are plentiful. The sugar-maple affords a large supply of excellent sugar. The metals and minerals of this country are iron, lead, copperas, flint, marble, pipe-clay, and vitriol. The trade of Vermont is principally carried on with Boston, Portland, Hartford, and New York; whither the inhabitants export horses, beef, pork, butter, cheese, wheat, flour, iron, nails, pot and pearl ashes. The climate resembles that of New Hampshire, and is upon the whole very healthy: the winters, however, are long and severe, and the summers hot. The inhabitants are for the most part emigrants from Connecticut and Massachusetts, and their descendants. The only foreigners are Scots, who have formed a settlement. As to the character, manners, customs, laws, policy, and religion of the people in Vermont, we need only say that they are New-Englandmen.

Before the late war, this tract of country was claimed both by New York and New Hampshire; but upon the commencement of hostilities between Great Britain and her colonies, the inhabitants considered themselves as free from any legal jurisdiction, and associating together, formed for themselves a constitutional government; and before it was acknowledged by congress on the 4th of March, 1791, as the fourteenth state; they commenced their political independent existence as a separate government in the year 1777. On the 15th of December in this year, their representatives, in convention at Windsor, declared that the territory called Vermont, was and of right ought to be a free and independent state; and for the purpose of maintaining regular government in the same, they made a solemn declaration of their rights, and ratified a constitution, of which the following is an abstract.

Their declaration, which makes a part of their constitution, asserts that all men are born equally free—with equal rights, and ought to enjoy liberty of conscience—freedom of the press—trial by jury—power to form new states in vacant countries, and to regulate their own internal police: that all elections ought to be free: that all power is originally in the people: that government ought to be instituted for the common benefit of the community, and that the community have a right to reform or abolish government: that every member of society hath a right to protection of life, liberty, and property; and in return is bound to contribute his proportion of the expence of that protection, and yield his personal service when necessary: that he shall not be obliged to give evidence against himself: that the people have a right to bear arms, but no standing armies shall be maintained in time of peace: that the people have a right to hold themselves, their houses, papers, and possessions free from search or seizure; and therefore warrants without oaths first made, affording sufficient foundation for them, are contrary to that right, and ought not to be granted: that no person shall be liable to be transported out of this state for trial for any offence committed within this state, &c.

By the frame of government, the supreme legislative power is vested in a house of representatives of the freemen of the state of Vermont, to be chosen annually by the freemen on the first Tuesday in September, and to meet the second Thursday of the succeeding October: this body is vested with all the powers necessary for the legislature of a free state: two-thirds of the whole number of representatives elected, make a quorum.

Each inhabited town throughout the state has a right to send one representative to the assembly.

The supreme executive power is vested in a governor, lieutenant-governor, and twelve counsellors, to be chosen annually in the same manner, and vested with the same powers as in Connecticut.

Every person of the age of twenty-one years, who has resided in the state one whole year next before the election of representatives, and is of a quiet, peaceable behaviour, and will bind himself by his oath, to do what he shall in conscience judge to be most conducive to the best good of the state, shall be entitled to all the privileges of a freeman of this state.

Each member of the house of representatives, before he takes his seat, must declare his belief in one God, in future rewards and punishments, and in the divinity of the scriptures of the Old and New Testament, and must profess the Protestant religion.

Courts of justice are to be established in every county throughout the state.

The supreme court, and the several courts of common pleas of this state, besides the powers usually exercised by such courts, have the powers of a court of chancery, so far as relates to perpetuating testimony, obtaining evidence from places not within the state, and the care of the persons and estates of those who are *non compotes mentis*, &c. All prosecutions are to be commenced in the name, and by the authority of the freemen of the state of Vermont. The legislature is to regulate entails so as to prevent perpetuities.

All field and staff-officers, and commissioned officers of the army, and all general officers of the militia, shall be chosen by the general assembly, and be commissioned by the governor.

Common schools and academies are liberally encouraged in Vermont; and in 1800 a college was incorporated in Middleburg, which is now in a flourishing state. See COLLEGE. Morse. Melish.

VERN, a town of France, in the department of the Dordogne; 10 miles S. of Perigueux.—Also, a town of France, in the department of the Mayne and Loire; 6 miles S. of Segré.

VERN, or *Vernde*, or *Werna*, a town of Westphalia, in the bishopric of Paderborn; 2 miles W.N.W. of Salzkotten.

VERNACIA, VENACIA, *Veniatia*, *Vernatia*, or *Veniana*, in *Ancient Geography*, a town of Spain, upon the route from Bracara to Asturia, between Complutica and Petavonium. Anton. Itin.

VERNACULAR is applied to any thing that is peculiar to some one country.

Whence, diseases which reign most in any particular nation, province, or district, are sometimes called *vernacular* diseases; though more frequently *endemic* diseases.

Such are the *plica Polonica*, *scorbutus*, *tarantism*, &c.

VERNAL, something belonging to the spring season. (See SPRING.) Hence, *vernal leaves* are those leaves of plants which come up in the spring, &c.

VERNAL *Signs* and *Equinox*. See SIGN and EQUINOX.

VERNAL *Grass*, in *Botany*. See ANTHOXANTHUM, and SWEET-*scented Vernal Grass*.

VERNAL, in *Geography*, a small island in the Pacific ocean, near the coast of Mexico. N. lat. 16° 35′. W. long. 95° 50′.

VERNAMO, a town of Sweden, in the province of Smaland; 35 miles N.W. of Wexio.

VERNANTOIS, a town of France, in the department of the Jura; 3 miles S. of Lons le Saulnier.

VERNASSA, a town of Genoa; 5 miles S.W. of Spezza.

VERNE, a town of France, in the department of the Doubs; 3 miles N. of Beaume les Dames.

VERNET, JOSEPH, in *Biography*, the best landscape painter of the French school, was born at Avignon in 1712. He was educated in his native country, and afterwards sent to Rome, where he studied under Adrian Manglard, a painter of sea-pieces and landscapes of some note. He soon surpassed his instructor, and the style which he adopted was as close an imitation of nature as he knew how to make; and his views of Rome and Naples, &c. will always please, from the freshness and spirit with which they are painted. His colouring, however, is not exactly true; the hues are too positive and crude, and lack the softness and delicacy of Claude or Wilson; but his compositions are excellently arranged, and he gave great truth of action to water; he also adorned his pictures with groups of figures, arranged with taste and freely executed.

He remained many years in Italy, till at length the reputation he had acquired induced Louis XIV. to invite him to return to France, where he was engaged to paint a set of views of the sea-ports of that kingdom. However correct these views may be, it is evident that Vernet did not labour *con amore* at them, as they by no means rival the pictures he painted of other subjects, where he was more free to follow his own taste. He was very much employed and honoured, and enjoyed the exercise of his talents till he arrived at the age of 77, when he died, in 1786.

VERNET, in *Geography*, a town of France, in the department of the East Pyrenées; 4 miles S. of Prades.

VERNET *le Bas*, a town of France, in the department of the Allier; 13 miles N. of Digne.

VERNEUIL, a town of France, and principal place of a district, in the department of the Eure; 18 miles W. of Dreux. N. lat. 48° 43′. E. long. 1′.—Also, a town of France, in the department of the Allier; 15 miles E. of Montmarault.

VERNEY, GUICHARD-JOSEPH DU, in *Biography*, an eminent anatomist, was the son of a physician at Feurs in Forez, and born in 1648. From Avignon, where he studied medicine for five years, he removed to Paris in 1667, and there acquired high reputation, not only as an anatomical demonstrator, but as an eloquent lecturer. His manner was ardent and interesting, and this, together with his youth and agreeable person, rendered the study of anatomy fashionable. After his admission into the Academy of Sciences in 1676, he employed himself in an assiduous prosecution of the natural history of animals, and the result of his researches may be found in the Memoirs of the Academy. About this time he was engaged in communicating anatomical instruction to the dauphin and his learned attendants; and in 1679 he was nominated professor of anatomy at the Royal Gardens, where his auditors were very numerous, many of whom were foreigners. In this and the following year he was occupied in Lower Brittany and on the coast of Bayonne in the dissection of fishes. His work entitled "Traité de l'Organe de l'Ouie, contenant le Structure, les Usages, et les Maladies de toutes les Parties de l'Oreille," was published in 1683, and translated into various languages. In his anatomical researches he was indefatigable, and he made many discoveries, the honour of which has been claimed by others. Having absented himself for a long time from the meetings of the Academy, he returned to it again, in his 80th year, on the republication of his History of Animals, and entered into its business with his former vivacity. In advanced age he undertook a work on insects and reptiles; and though he was afflicted with a pulmonary complaint, he exposed himself to the injurious effects of the damp and night air, in order to observe the actions of snails, with a view to the perfection of the work in which he was engaged. Although his health could not but be impaired by this practice, his life was prolonged to his 82d year, as he died in September 1730. He bequeathed his valuable anatomical preparations to the Academy, leaving a character held in high estimation by contemporary anatomists and physiologists, and by all who had enjoyed the benefit of his instruction in their youth. After his death, Senac published from his MSS. "Traité des Maladies des Os," in 2 vols. 12mo.; and all his memoirs and posthumous papers were collected in his "Œuvres Anatomiques," 2 vols. 4to. Paris, 1761, published by Bertin, to whom his MS. remains were entrusted by Senac. Haller. Gen. Biog.

VERNI, in *Geography*, a town of the republic of Lucca; 12 miles N. of Lucca.

VERNIA, in *Ancient Geography*, a name which Eustathius gives to one of the British isles, supposed by Ortelius to have been Hibernia.

VERNICIA, in *Botany*, so called by Loureiro, from *vernix*, varnish, because the nuts of this tree afford by pressure a kind of oily varnish, either used by itself to protect wood from the weather, or employed to adulterate the true Chinese or Japan varnish.—Loureir. Cochinch. 586.—Class and order, *Monoecia Monadelphia*. Nat. Ord. *Tricoccæ*, Linn. *Euphorbiæ*, Juss.

Gen. Ch. Male, *Cal.* Perianth tubular, in two rounded, erect segments. *Cor.* bell-shaped, of five oblong spreading petals, longer than the calyx. *Stam.* Filaments ten, combined at the base, the inner ones longest; anthers as many, arrow-shaped.

Female flowers few, on the same branch, *Cal.* and *Cor.* unobserved. *Pist.* Germen superior, roundish, three-lobed; style none; stigma obtuse, three-cleft. *Peric.* Drupa roundish, warty. *Seed.* Nut bony, bluntly triangular, rugged, of three cells, with an ovate-oblong kernel in each.

Eff. Ch. Male, Calyx two-lobed. Petals five. Stamens ten.—Female, Calyx .... Corolla .... Stigma obtuse, three-cleft. Drupa warty, with a triangular three celled nut.

1. V. *montana*. Cây dêau son, of the Cochinchinese. Tong xú, of the Chinese.—Native of mountainous woods in Cochinchina, as well as in China. A large *tree*, with ascending *branches*. *Leaves* scattered, stalked, slightly heart-shaped, pointed, entire, undulated, smooth, perforated with two glands at the insertion of the *footstalk*. *Flower-stalks* terminal, many-flowered, short. *Flowers* white.

The wood is of little use for building. The nuts afford a copious expressed oil, which is yellow, viscid, transparent, moderately liquid, used as a sort of varnish for arrows, and any wood exposed to the weather. It also serves to increase the bulk of the far more valuable Chinese varnish, obtained from the *Augia* of Loureiro; as well as to render that substance more fluid and manageable. For lamps it is useless, because it burns too fiercely and consumes too speedily.—We have not been able to reduce this plant to any known genus. All our knowledge respecting it is derived from Loureiro.

VERNIER, is a graduated index which subdivides the smallest divisions on any straight or circular scale, in the reading of which greater accuracy is required, than can be obtained by simple estimation of a fractional part, as indicated by a pointer, or fiducial edge. The vernier was first invented by Pierre Vernier of Franche Comté, and made known to the world at Bruxelles (or Brussels) in the year 1631, through the medium of a pamphlet entitled "La Construction, l'Usage, et les Proprietes du Quadrant nouveau de Mathematique," &c. It soon gained the preference over the scale of Nonius, which was a circular diagonal scale, and which by some writers is yet confounded with a Vernier's index, though there is no greater resemblance between the two, than exists between the dial of a clock and the hand that points to it. The vernier is applicable to any straight or circular line, provided the divisions be equal; but the contrivance of Nonius was in the graduated line or scale itself, and required the aid of a fiducial edge as an index. We have given the representation of a *vernier* in several of our astronomical plates, when we were describing CIRCLE, EQUATORIAL, QUADRANT, TRANSIT-*Instrument*, and THEODOLITE, therefore it will not be necessary to introduce any other figure for the purpose of illustration; particularly as the *principle* of its application can be made clearly intelligible by either arithmetical or algebraical notation. Let us suppose two lines, either straight or portions of circles, to be exactly alike in dimensions, one called A, and the other C, and let one of them be divided into more equal parts than the other by *unity*; then will the difference of any two of the equal parts of the two lines, or arcs respectively, be a fraction, the numerator of which is the common length of the equal lines, or arcs, and the denominator the product of the numbers of parts into which each is divided. For if we put A for the common length of the equal lines, or arcs, with n and $n+1$ for the equal parts into which each is divided respectively, the length of the divisions of each will be $\frac{A}{n}$ and $\frac{A}{n+1}$, and their difference $\frac{A}{n} - \frac{A}{n+1} = \frac{A}{n \times \overline{n+1}}$.

To exemplify this principle in an arc of small radius, let each degree be divided by an engine into three parts, of each 20′, and let it be required that the vernier shall read to the accuracy of one minute; in this case the short scale of the vernier must be divided into 20 parts, and the equal arc on the limb of the instrument either into 21 or 19 parts, so that the difference of the two equal arcs, in divisions, may be = 1; if 21, the former number, is adopted, the reading will be in a backward direction; but if the latter (*viz.* 19), it will be forward; let the arc on the limb be 6° 20′, and let each degree be divided into three parts, of 20′ each; also let 19 be the number of such parts or divisions; and let the equal arc on the vernier be divided into 20 equal parts; then $n = 19$, and $n + 1 = 20$ will make a difference between a single division of the limb, and one of the vernier $= \frac{6° \, 20'}{19 \times 20} = \frac{380'}{380} = 1'$, as was required. This *difference* becomes the index for subdividing the smallest divided space of the limb, and it is ascertained how often it must be taken, by inspecting the place on the divided vernier, where a stroke on it exactly coincides with a dividing stroke on the divided limb of the instrument; for instance, if the zero, or stroke marked 0, be the coincident one, the reading may be had from the divisions of the limb only, without any addition from the vernier; but if the coincidence happens at any other place, say at stroke 5, stroke 8, or stroke 10, as numbered on the vernier, then 5′, or 8′, or 10′, as the case may be, must be *added*, as the measure of a fractional part of a division, to the measure read from the divisions only, that are contained between zero on the limb and zero on the vernier: the difference, which we have said is = 1′ when taken once, is 5′ when taken five times, and 8′ when taken eight times; and as the point of coincidence can never be mistaken, wherever it may fall, it will always determine how many minutes must be *added* for the fractional portion of a division, that zero of the vernier has advanced into an entire division; and as the eye will form a rough judgment at once, whether zero of the vernier is near $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, or $\frac{3}{4}$ of a space on the limb, this notice will at once guide the observer to that part of the vernier's scale, where the coincidence will be immediately found; for as zero of the vernier advances in any division of the limb, by the slow motion of the tangent-screw of any instrument, the point of coincidence of the strokes of the two arcs advances with it, till the stroke at zero becomes itself coincident with a new dividing stroke of the arc on the limb, which coincidence denotes the addition of another 20′, in our example, without reference to the vernier: but should there be any doubt about the exactitude of the coincidence, 20″, 30″, or 40″, may be taken instead of the last minute, accordingly as the eye can best judge of the

the fmall quantity fhort of perfect coincidence; and examining the places of the preceding and following ftrokes will greatly affift in forming this judgment.

If we were to fubftitute 21 for 19 fpaces on the limb, the refult would be the fame, with the inconvenience of reading backwards, and of fubtracting inftead of adding; for $\frac{7^\circ}{21 \times 20} = \frac{420'}{420} = 1'$, as before; but inftruments of modern conftruction are exempt from this inconvenience, by having always one more divifion on the fcale of the vernier, than on the equal arc of the limb.

In Troughton's fnuff-box fextant, which is a very convenient inftrument for the pocket, the radius of the divided arc is only about $1\frac{3}{4}$ inch, and the degree is divided, therefore, into two fpaces only, fo that 30′ are neceffarily indicated by the vernier; and as 29 fpaces on the limb are taken equal to 30 on the vernier, the fmalleft quantity indicated is $\frac{14^\circ 30'}{29 \times 30} = \frac{870'}{870} = 1'$, as before; and the reading of the coincidences that indicate the laft 30′ is progreffive, like the reading on the limb of the inftrument.

In the common ebony fextant, the degree is fometimes divided into four parts, by reafon of the increafed length of the radius; confequently, when the reading is in a forward direction, fifteen divifions on the vernier occupy the fame arc as fourteen on the limb; and the fmalleft quantity indicated thereby is $\frac{3^\circ 30'}{14 \times 15} = \frac{210'}{210} = 1'$; but the brafs fextants made and divided by the beft makers, have the minute fubdivided into twenty, fifteen, ten, or even five feconds, according to the length of the radius, by means of a vernier with divifions and fubdivifions, acting with divifions and fubdivifions on the limb, which is a refinement of the original invention, introduced by Troughton, in confequence of the fuperior excellence of modern dividing. We have now before us one of Ramfden's beft brafs fextants of $9\frac{1}{2}$ inches radius, on the limb of which the degree is divided into three parts, and 40 divifions on the arc of the vernier meafure 39 divifions on the limb; therefore $\frac{13^\circ}{39 \times 40} = \frac{780'}{1560} = \frac{46800''}{1560} = 30''$ is the fmalleft quantity that the vernier will indicate, and every alternate ftroke thereon counts one minute as the coincidence advances. This mode of reading the vernier doubles its former accuracy. But on the limb of this fame inftrument, the late Mr. W. Walker prevailed on Mr. Troughton to divide a fecond arc, within the former, which by our meafurement is only of nine inches radius: in this inner arc, which reads with the inner arc of the vernier, the degree is firft divided into halves, and then each half is fubdivided into five fmaller divifions, by fhorter ftrokes very delicately cut, fo that the degree is divided into ten fmall fpaces, of 6′ each, which are to be read before the vernier's fubdivifion of one of thefe fpaces is examined. On the fcale of the inner vernier are 72 fmall divifions, co-extenfive with 71 on the limb; and as each of thefe is = 6′, we have $71 \times 6' = 426'$, or 25560″ for the whole arc of meafurement: confequently $\frac{25560''}{71 \times 72} = \frac{25560''}{5112} = 5''$ is the fmalleft quantity that can be indicated by fuch a vernier, and accordingly we obferve on the fcale of the Vernier twelve fmall or fubdividing fpaces between each minute ftroke; *i. e.* every twelfth ftroke is a long one, and they are numbered 1, 2, 3, &c. up to 6, which is the value of one of the fmalleft divifions on the limb, and confequently the value of each fubdivifion on the fcale is $\frac{1}{12}$ of 1′, or 5″: and yet, by the help of a high magnifier, placed in the centre of an illuminating reflector of plaifter of Paris, this fmall quantity may be clearly difcriminated. When Ramfden firft faw this wonderful application of the powers of the dividing engine, he called his workmen together, to witnefs what he at firft confidered the folly of attempting greater accuracy than was practicable; but a clofe examination of the divifions convinced him, that his preconceived opinion had ftood in the way even of his own improvements.

Sometimes a divided head or nut has been fixed on the end of the tangent-fcrew of flow motion, particularly by the older makers of pillar and mural aftronomical quadrants, in order to fubdivide the divifions of the vernier, as may be feen at Greenwich, Richmond, and other obfervatories; but when this apparatus has been in ufe fome time, the parts become loofe and inaccurate, even allowing that the meafuring fcrew itfelf can be confidered as perfect in all refpects. On an examination of fome of Graham's, the Siffons' and Bird's quadrants, we find that though the accuracy of 1″ is profeffed by the conftruction, yet very little dependence can be placed on fuch profeffion after the parts have been for years in ufe. Of this conclufion Ramfden was no doubt fenfible, when he introduced into his larger inftruments the microfcopic readings, with a good fcrew at the focus of the eye-piece of a compound microfcope, where there is not fo much ftrefs on the fcrew as at the periphery of the arc, where the fcrew forms alfo a part of the clamping apparatus. To this adoption of the ufe of a compound microfcope, in conjunction with the fubfequent improvements in the art of dividing, much of the claim to fuperior excellence in our Englifh aftronomical inftruments is to be attributed, which claim is ftill further fupported by the invention of the achromatic object-glafs and improved eye-pieces of the telefcopic portion.

Hitherto we have confidered the principle and application of a fingle vernier only, which is in itfelf an ufeful and beautiful contrivance; and, as we have faid, may be applied with advantage to fubdivide a ftraight line; as, for inftance, the fcale of a barometer into hundredth parts of an inch, or the fcale of Dollond's divided object-glafs micrometer into the five-hundredth parts, or more; but with an entire circle that is graduated all round, the accuracy of an obfervation is greatly augmented, nay enfured, by the ufe of different verniers reading at different parts of the limb at the fame time. At firft two diametrically oppofite verniers were introduced, as has been afferted, by one of the Siffons, though, we underftand, not with a view to reading at oppofite fides of the circle, by way of correcting the obfervation by an average; feeing that the remote end of the vernier bar had only a fingle ftroke anfwering to zero of the other; but fubfequently, in tranfit and other inftruments ufed with a fpirit-level, the double vernier became a valuable appendage, particularly when the conftruction of the inftrument admitted of inverfion of the pofition of the axis, fo as to procure a double obfervation; and thence the true zero of the graduation of the meafuring limb. This ufeful property was extended, we believe, by Troughton, firft by introducing four, and then, with equal advantage, three equidiftant verniers of fimilar powers. We have fhewn the great ufe of additional verniers, at confiderable length, under our article Circle, particularly with refpect to the property that three poffefs of correcting for the excentricity as well as inequality of the divifions of a circular inftrument; and that as great accuracy may be expected from one *croffed* obfervation with Troughton's reflecting circle, or from a pair of reverfed obfervations with a theodolite, with either circle, that has three verniers, as can be obtained by a repe-

a repetition of obfervations on the repeating circle; for, by the mode in which Troughton's circular inftruments are ufed, the readings will be had at fix different points of the circle, though very little time is expended in making the obfervations. It is hardly neceffary to add here, that when an inftrument is of the reflecting kind, its divifions are doubly numerous for the fame radius, when compared with an inftrument that meafures only by direct vifion; and that therefore the divifions on the vernier muft be calculated to have their dimenfions accordingly. In Troughton's reflecting circle of five inches radius, the degree is divided into three parts, and fifty-nine of thefe are commenfurate with fixty on the fcale of each of the three verniers; therefore the excefs of a fpace on the limb over one on the vernier is $\frac{19° 40'}{59 \times 60} = \frac{70800''}{3540} = 20''$, which is the fmalleft quantity that a fingle vernier will indicate; but as there are fix readings in the croffed obfervation, which obfervation annihilates the errors of zero, and of the darkening glaffes when ufed, it is to be inferred that the refult will be accurate to $\frac{20''}{6}$, or little more than *three feconds*, if we difregard the probable errors of reading, and of taking contacts in the obfervation, common to all inftruments. The figures of the vernier fcales in this circle count both ways, from each end, becaufe the figures read both to the right and left of zero on the limb, but there can be no miftake if the figures of the vernier are counted the fame way that the limb of the circle reads. Formerly the zero of the vernier was placed at the middle of its fcale; and when it read out at one end, it commenced at the other, and finifhed again in the middle; but this method, being liable to mifapprehenfion, is now difcontinued.

In an eighteen-inch aftronomical circle, by Troughton, at prefent under our examination, which has four verniers at equal diftances, and turns in azimuth, the degree is divided by Engine into twelve divifions, of which 59 fill the fame arc as 60 on the verniers refpectively; hence we have $59 \times 5' = 295'$, or $17700''$ for the numerator, and $59 \times 60 = 3540$ for the denominator, and $\frac{17700''}{3540} = 5''$, the fmalleft quantity that one vernier will indicate; and accordingly the fpace between zero and $1'$ on the vernier is fubdivided in 12 fmaller fpaces, fo that each fucceffive coincidence will mark out $5''$ on each feparate vernier; but as there are four verniers, and as the circle will reverfe in pofition by means of the azimuthal motion, there will be virtually eight readings from which to take an average of $5''$, fo that the probable accuracy refulting from fuch average comes *within the fecond*, and would have done fo if there had been only three verniers. Hence the advantage gained over the average of the verniers by microfcopic readings, is probably not fo great as is generally fuppofed.

VERNIO, in *Geography*, a town of Etruria; 11 miles N.W. of Piftoya.

VERNIS MARTIN. See *Copal* VARNISH.

VERNISH. See VARNISH.

VERNISSON, in *Geography*, a river of France, which runs into the Loing, near Montargis.

VERNODUBRUM, in *Ancient Geography*, a river of Gallia Narbonenfis. Pliny.

VERNOIL, in *Geography*, a town of France, in the department of the Mayne and Loire; 14 miles S.E. of Baugé.

VERNON, in *Biography*, an Englifh finger, brought up at St. Paul's under Savage, was felected from among the chorifters of that cathedral, in 1750, to perform the part of Puck the fairy in Queen Mab. When his voice broke into a tolerable tenor, he was engaged at Drury-lane theatre to fupply the place of Lowe, who was degraded into a finger at Sadler's Wells and Cuper's Gardens. Vernon, with a voice much inferior to that of Lowe at his beft, was a much better mufician and actor, and had not only all Lowe's parts affigned to him at Drury-lane, but fucceeded him at Vauxhall, where, and at the theatre, he continued to perform till the time of his death.

Vernon was not only the profeffional fucceffor to Lowe, but heir to his imprudence and debauchery.

VERNON, in *Geography*, a town of France, in the department of the Eure, on the fouth fide of the Seine; 15 miles E.N.E. of Evreux.

VERNON, formerly *Hinfdale*, a town of America, in Windham county and ftate of Vermont, on the W. bank of Connecticut river; containing 1159 inhabitants.—Alfo, a town of Suffex county, in the ftate of New Jerfey, 21 miles N.E. of Newtown; containing 1708 inhabitants.—Alfo, a town of Trumbull county, in the diftrict of Ohio; containing 606 inhabitants.

VERNON, *Mount*. See MOUNT *Vernon*.

VERNONBURG, a town of the ftate of Georgia; 11 miles S. of Savanna.

VERNONIA, in *Botany*, was fo named by Schreber, in memory of Mr. William Vernon, fellow of St. Peter's college, Cambridge, who towards the end of the feventeenth century made a voyage to Maryland, in company with Dr. David Kreig, a German phyfician, of which botany was the principal object. Their herbarium, confifting, it is faid, of feveral hundred new plants, came into the poffeffion of fir Hans Sloane, and contributed to enrich the fupplement, or third volume, of Ray's *Hiftoria Plantarum*. A North American genus therefore is peculiarly proper to commemorate Mr. Vernon; whofe merits as an accurate and induftrious Englifh botanift are, moreover, recorded by Ray in the preface to his *Synopfis*, ed. 2d, and his name often occurs in the cryptogamic part of that work. We find no further mention of this gentleman, nor does he appear any where as an author.—Schreb. Gen. 541. Willd. Sp. Pl. v. 3. 1632. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 502. Michaux Boreal.-Amer. v. 2. 94. Purfh 511.—Clafs and order, *Syngenefia Polygamia-æqualis*. Nat. Ord. *Compofitæ capitatæ*, Linn. *Cinarocephalæ*, Juff.

Gen. Ch. *Common Calyx* ovate, imbricated, with numerous, ovato-lanceolate, pointed, coloured fcales. *Cor.* compound, uniform, all the florets, tubular, equal and perfect, of one petal, funnel-fhaped; the tube inflexed; limb with five recurved fegments. *Stam.* Filaments five, capillary, very fhort; anthers united into a cylindrical tube. *Pift.* Germen oblong; ftyle thread-fhaped, the length of the ftamens; ftigmas two, reflexed. *Peric.* none, the calyx remaining unchanged. *Seeds* folitary, ovate. Down capillary, coloured, feffile, longer than the calyx, furrounded at its bafe with a very fhort crown, of many chaffy briftles. *Recept.* naked, flat.

Eff. Ch. Receptacle naked. Calyx ovate, imbricated. Florets tubular, five-cleft. Seed-down double; the outer chaffy, fhort; inner capillary.

The fpecies of this genus, as far as they were known to Linnæus or Juffieu, were referred by both to SERRATULA; fee that article and LIATRIS. Thefe genera differ very clearly from *Vernonia* in their feathery feed-down, deftitute of furrounding fcales or briftles, and the firft of them has, moreover, either a fcaly or a villous receptacle. Seven fpe-

cies of *Vernonia* have been determined, all of them, except one, natives of North America, and all herbaceous and perennial, except that one, which is annual and of East Indian origin.

1. V. *noveboracensis*. Long-leaved Vernonia. Willd. n. 1. Ait. n. 1. Pursh n. 5. Bigelow Bost. 187. (Serratula noveboracensis; Linn. Sp. Pl. 1146. S. noveboracensis maxima, foliis longis serratis; Dill. Elth. 355. t. 263. Pluk. Phyt. t. 109. f. 3; see Dill.)—Leaves lanceolate, rough, finely serrated. Corymb level-topped. Calyx-scales with slender points.—By road-sides, and in old pastures, from Canada to Carolina, flowering from August to October. *Pursh*. *Stem* four or five feet high, erect, furrowed, purplish, clothed with abundance of scattered, nearly sessile, long and narrow *leaves*; paler underneath. *Flowers* numerous, dark purple, turning nearly black in decay. Scales of the *calyx* ending each in a fine slender awn. *Bigelow*.

2. V. *praealta*. Tall Vernonia. Willd. n. 2. Ait. n. 2. Pursh n. 4. (Serratula praealta; Linn. Sp. Pl. 1146. Mill. Ic. t. 234. S. virginica, persicæ folio, subtùs incano; Dill. Elth. 356. t. 264. Eupatoria virginiana, serratulæ noveboracensis latioribus foliis; Pluk. Almag. 141. Phyt. t. 280. f. 6.)—Leaves lanceolate, serrated; downy beneath. Corymb level-topped. Calyx-scales ovate, pointed.—By road-sides and the borders of woods, from New England to Carolina, flowering from August to October.—A tall rough-looking plant. *Pursh*. *Flowers* purple. *Calyx-scales* with shorter points than the last; and *leaves* more downy beneath. Linnæus did not well distinguish these two species, nor have we been able to compare authentic specimens.

3. V. *glauca*. Glaucous-leaved Vernonia. Willd. n. 3. Ait. n. 3. (Serratula glauca; Linn. Sp. Pl. 1146. S. marilandica, foliis glaucis, cirsii instar denticulatis; Dill. Elth. 354. t. 262.)—Leaves lanceolate, serrated; glaucous beneath. Corymb repeatedly compound, level-topped. Calyx-scales ovate, acute.—Native of North America. This is omitted by Pursh, nor have we seen any certain specimen. Dillenius represents it with broader *leaves* than either of the former. A garden specimen communicated by sir Joseph Banks under this name, has smooth *leaves*, glaucous beneath; but the points of its *calyx-scales* are as long as in the first. Perhaps Willdenow's specific characters, almost entirely founded on the *calyx*, may be fallacious. The points of the scales appear variable in length, in all the specimens that have fallen in our way, all of which we should esteem one species, answering best, on the whole, to the characters of *V. noveboracensis*. The roughness of the *leaves* in any of them is but slight.

4. V. *fasciculata*. Tufted Vernonia. Michaux Boreal.-Amer. v. 2. 94. Pursh n. 3.—"Leaves linear, elongated, sparingly serrated. Flowers corymbose, erect, crowded. Calyx ovate, smooth, with pointless scales."—Native of meadows in the Illinois country. *Michaux*. In Virginia, flowering from August to October, the *flowers* small. *Pursh*. This, at least, should seem to be a distinct species.

5. V. *angustifolia*. Narrow-leaved Vernonia. Michaux ibid. Pursh n. 2. (Chrysocoma graminifolia; Walt. Carol. 195.)—Leaves crowded, linear, elongated, nearly entire. Corymb somewhat umbellate. Calyx-scales with little rigid points.—In barren sandy woods from Virginia to Georgia, flowering in August and September. *Flowers* the size and figure of *V. praealta*. *Pursh*. Considering how much some plants, nearly related to this, though of different genera, are liable to vary in the breadth of their foliage, we cannot but suspect this as a doubtful species, like some of the foregoing.

6. V. *oligophylla*. Few-leaved Vernonia. Michaux ibid. Pursh n. 1. (Chrysocoma acaulis; Walt. Carol. 196.)—"Stem simple, nearly naked. Leaves serrated; radical ones oblong-ovate; the rest lanceolate. Corymb panicled."—Native of South Carolina. *Flowers* purple, as in all the preceding. *Pursh*. Michaux distinguishes two varieties; one denominated *verna*, in which both flowers (of two that we presume stand together) are stalked; the other *autumnalis*, in which one of these flowers is nearly sessile.

7. V. *anthelmintica*. Worm-seed Vernonia. Willd. n. 4. Ait. n. 4. (Conyza anthelmintica; Linn. Sp. Pl. 1207. Scabiosa conyzoides, foliis latis, dentatis, semine amaro lumbricos enecante; Burm. Zeyl. 210. t. 95. Cattu-schiragam; Rheede Hort. Malab. v. 2. 39. t. 24.)—Leaves elliptical, serrated, roughish, tapering at each end; most downy beneath. Flowers terminal, about three together.—Native of various parts of the East Indies. The seeds were sent to Kew, in 1770, by M. Richard, and have been received since from time to time. This species, well removed hither by Willdenow from *Conyza*, is annual, or, in our stoves, biennial, flowering in summer. The *stem* is branched, several feet high, bushy, downy. *Leaves* stalked, coarsely serrated, two or three inches long, veiny, more or less downy on both sides. *Flowers* pale purple, larger than any of the American species. *Calyx-scales* each tipped with a linear leafy point, very various in length. *Seed-down* exactly answering to the generic character, and well described by Burmann. The *seeds* powdered, and drank with warm water, are used in India to kill intestinal worms in children.

VERNOSOLA, in *Ancient Geography*, a place in Gallia Aquitannica; 15 miles from Aquæ Siccæ. Anton. Itin.

VERNOUX, in *Geography*, a town of France, in the department of the Ardèche; 14 miles S. of Tournon.

VERODUNUM, in *Ancient Geography*, a town of Belgic Gaul, on the route from Durocorvorum to Divodurum, between Ad-Fines and Axuenna. Anton. Itin.

VEROFABULA, a town of Asia, in Phœnicia.

VEROLAMUM, or VERULAMIUM, a town of Great Britain, mentioned in several routes of Antonine, situated between Durocobrivæ or Dunstable, and Sullioniacæ or Brockley Hills. Antiquaries have no dispute about the situation of this town, which was undoubtedly at Verulam, near St. Albans. It was a very flourishing and populous city in the Roman times, and honoured with the title and privileges of a municipium or free city. Dion Cassius says that it was the capital of the Catuellani, whom Ptolemy calls Catyeuchlani.

VEROLI, in *Geography*, a town of the Popedom, in the Campagna di Roma, the see of a bishop, under the pope; it contains eight churches and three convents; 3 miles S. of Alatri. N. lat. 41° 42′. E. long. 13° 20′.

VEROMANDUI, in *Ancient Geography*, a people of Belgic Gaul, according to Cæsar and Pliny. Their habitation was S. of the Nervii, N. of the Suessones, E. of the Ambiani, and W. of the forest of the Ardennes. They were able to furnish no more than 1000 men in a common war against the Romans.

VEROMETUM, a town of Great Britain, in the sixth Iter of Antonine, between Ratæ or Leicester, and Margidunum, near East Bridgeford; placed near Willoughby.

VERON, in *Geography*, a town of France, in the department of the Yonne; 5 miles S.S.E. of Sens.

VERONA, in *Ancient Geography*, a town of Italy, in Venetia, towards the W., upon the Athesis. It was founded by the Eugenians, from whom it passed to the Cenomans, who driven from Brixia, settled here. Martial says, that Verona was no less indebted to the birth of Catullus than Mantua to that of Virgil. Under the reign of Vitellius, the partisans

partisans of Vespasian made it a place of arms. Towards the year 249 A.D., the emperor Philip was put to death in this city, or its environs, by order of Decius. Under the empire of Carus, in 284, Sabinus Julianus revolted and took possession of Verona, but he was defeated by the emperor near the walls of the city. It shut its gates against Constantine, when he took possession of the empire against Maxentius; but opened them after the defeat of the latter to the conqueror, who treated the inhabitants with moderation after his victory. In 568, Verona was transferred to the Lombards. See the next article.

VERONA, in *Geography*, a city of Italy, and capital of the Veronese, the see of a bishop, situated on the Adige. It is fortified in the ancient manner, and defended by three castles; two of which, namely, St. Felix and St. Pietro, stand on a hill; and the third, called Il Castello Vecchio, and a kind of citadel, lies in a plain along the river Adige, which runs through the city, and over which are four stone bridges, of which the principal, near the last-mentioned castle, is 348 feet long. The city makes a better appearance by its delightful outlets than within, most of the streets being narrow, crooked, and dirty, and the houses but mean. The number of its inhabitants is now computed to amount to nearly 50,000, but formerly was much greater. The best street is that called the Corso, which is pretty long. The cathedral is an old building. One of the finest churches is that of St. Georgio, belonging to the Benedictines. The palace in which the society, or academy, of Philharmonics assemble, as also the society of the Philati, in order to the revival and improvement of martial exercises, is remarkable, particularly on account of the great collection of all the ancient inscriptions and monuments in the Etrurian, Punic, Egyptian, Greek, and Latin languages, found or brought here for a great many years past. The largest square in the city is the Piazza d'Armi, in which is a marble statue, representing the city of Venice. In the Palazzo della Regione, or the Guildhall, are the statues of five illustrious natives of Verona, *viz.* Catullus, Marcus Æmilius, Cornelius Nepos, the elder Pliny, and Vitruvius; but the most valuable piece of antiquity here is the celebrated Roman amphitheatre, (see AMPHITHEATRE,) which so far exceeds all others, the steps, or seats, on which the people sat, being still entire; though, in reality, but little of it appears ancient, having been carefully repaired, from time to time, at the city's expence. The learned count Maffei computed that it held 22,184 spectators: the outward wall and the upper story are wanting. Near this city is a delightful place, called Campus Martius, at present used for the annual fair; it is constructed in a quadrangular form, with four gates, and in the centre, along the stands and booths, which are placed in a direct line, one may see all the four gates. The trade of this city is not improved as it might be, by supplying other countries with the medicinal plants growing on Monte Balbo, olives, oil, wine, and very good linen, sewing silk, and woollen stuffs. The Scaligeri were lords of this city for 170 years; and one of them, for his greater security, and to keep the city in awe, built the Castello Vecchio, and the large stone bridge. In 1387, Galeasso Maria, first duke of Milan, drove out the Scaligeri, and usurped the sovereignty of this city; but in the year 1409, the Venetians became masters of it. In 1796, Verona was taken by the French; 60 miles W. of Venice. N. lat. 45° 37′. E. long. 8° 9′.

VERONESE, ALESSANDRO, called *L'Orbetto*, in *Biography*, was born at Verona in 1582. He acquired the name of Orbetto, from having been, whilst a boy, the conductor of a blind beggar; from this condition he was rescued by Domenico Riccio, and instructed in the art of painting, for which he had exhibited considerable ability. After passing some years with Riccio, of whom he became the rival rather than the scholar, he went to Venice, and there studied under Carlo Cagliari, and acquired an excellent idea of colouring. He then went to Rome, and drew attentively, and in the end composed a style of his own, in which he attempted to combine the excellencies of the two schools in which he had studied, and in a great degree succeeded.

He had a ready imagination, so that frequently he proceeded to paint his smaller works without any preparatory sketch. We seldom see in this country any other than small productions of this celebrated master, and those generally painted upon marble, but it is not upon them that his fame is founded. Lanzi, speaking of a picture of his in the church of S. Stefano in Verona, called the Forty Martyrs, says, "it is a work which, in the impasto of colour, and the keeping, has the quality of the Lombard school; it partakes of the Roman in design and expression, and of the Venetian in colouring. It is the most studied, the most finished, the gayest, that he ever made, with a degree of beauty in the heads, almost rivalling those of Guido; and with so much art in the composition, that all is understood, even the multiplied circumstances which are introduced in the background of the picture."

There is also another fine picture by him at Verona, a Pietà, in the church of the Misericordia, which is esteemed one of the very finest in that city. He maintained himself fully in competition with Andrea Sacchi and Pietro da Cortona, in the church of La Conceffione; and he painted several other pictures for public buildings in Rome. He died at Rome 1648.

VERONESE, PAOLO. See CAGLIARI.

VERONESE, in *Geography*, a province of Italy, so called from its capital, Verona, bounded on the north by the Trentin, on the east by the Vicentin, on the south and south-west by the Mantuan, and on the west by the lake of Garda; about 50 miles in length, and 25 in breadth. The soil is fertile, and produces plenty of silk, corn, wine, oil, and the most delicious fruits. The Veronese was anciently a Roman colony; afterwards it made a part of Lombardy. After divers revolutions, it became the property of the house of Este, from whence it fell to the dukes of Milan; and in 1409, to the Venetians.

VERONICA, a term abbreviated from *vericonica*, of *vera-icon*, q. d. *true image*, and applied to portraits, or representations of the face of our Saviour on handkerchiefs. Veronicas are imitations of that celebrated original one, preserved with great veneration at St. Peter's in Rome; and imagined by some to be the handkerchief laid over our Saviour's face in the sepulchre.

The first mention we find of this famous relic is in a ceremonial compiled in 1143, dedicated to pope Celestine, by Benedict, a canon of St. Peter's: but there is no mention made of the time when it was brought to Rome. A feast is kept in honour thereof in most churches, on the Tuesday in Quinquagesima week.

It is to be observed, that the name veronica is only given to such handkerchiefs as represent no more of our Saviour than his face; for such as represent his whole body, as that of Besançon, which shews his fore-part at length; and that of Turin, which represents both his fore and hind-part, as having covered him all over, were never called by this name.

The painters sometimes represent the veronica as held up by an angel, but most commonly by a woman, which woman the common people imagine to be a saint, called St. Veronica; a person of that name having been supposed,

posed, about the ninth century, to have presented her handkerchief to our Saviour as he went to Calvary, to wipe his face, when the picture was miraculously impressed upon it. This woman, it was added, was the person troubled with the flux of blood mentioned in the Gospel; and accordingly, she was soon joined with St. Fiacrius, and invoked together with him against the hæmorrhoids. And hence the establishment of feasts in honour of St. Veronica, in the churches dedicated to St. Fiacrius.

The milliners have taken St. Veronica, or, as they call her, St. *Venisse*, or St. *Venecia*, or *Venisa*, for their tutelary saint.

Veronica, in *Botany*, an old, but not classical, Latin name, whose derivation has occupied and perplexed etymologists as much as any upon record. Linnæus thought it a corruption of *Vetonica*, which, as professor Martyn observes, confounds it with *Betonica*. The same learned writer gives us a Greek etymology, from Hoffmann, φερονικη, composed of φερω, *to bear*, and νικη, *victory*, or *distinction*, as if we should say in English, *bearing the bell*, on account of its beauty. But we doubt whether this be more than a pun. Its common etymology is of a mule kind, between Greek and Latin, from *verus*, or rather *vera*, *true*, and εικων, *a figure*; and this, illiterate and barbarous as it is, has the sanction of the superstitious legend of St. Veronica, whose handkerchief is recorded to have received the impression of our Saviour's face, as he used it, in bearing his cross to the place of his crucifixion. But we find nothing analogous in any of the herbs which has borne this name, nor any character, true or false, stamped upon them, except that of their own peculiar beauty. Ambrosinus says the word is German, and originated in the druggists' shops of that country, though he favours the idea of its being corrupted from *Vetonica*, our *Betonica*, or Betony. The chief object of this controversy is to learn the true pronunciation of the name in question. If there be any truth in its Greek origin, the *i* must be long; but if otherwise, the analogy of *Betonica* may justify the usual practice, of throwing the accent on the *o*.—Linn. Gen. 12. Schreb. 15. Willd. Sp. Pl. v. 1. 54. Vahl Enum. v. 1. 55. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 15. Prodr. Fl. Græc. Sibth. v. 1. 5. Ait. Hort. Kew. v. 1. 26. Brown Prodr. Nov. Holl. v. 1. 434. Pursh 10. Tourn. t. 60. Juss. 99. Lamarck Dict. by Poiret, v. 8. 505. Illustr. t. 13. Gærtn. t. 54. (Hebe; Juss. 105.)—Class and order, *Diandria Monogynia*. Nat. Ord. *Personatæ*, Linn. *Pediculares*, Juss. *Scrophularinæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four, rarely five, deep, lanceolate, acute, sometimes obovate, permanent segments. *Cor.* of one petal, wheel-shaped; tube almost as long as the calyx; limb flat, in four deep, ovate, unequal segments, the lowermost narrowest, the opposite one broadest. *Stam.* Filaments two, inserted into the tube of the corolla, spreading, ascending, tapering downwards; anthers roundish-oblong. *Pist.* Germen superior, compressed; style thread-shaped, the length of the stamens, declining; stigma simple, obtuse. *Peric.* Capsule inversely heart-shaped, or somewhat elliptical, compressed in the upper part, of two cells, and two, more or less cloven, valves. *Seeds* numerous, roundish.

Ess. Ch. Corolla four-cleft, wheel-shaped; its lower segment narrowest. Capsule superior, of two cells.

Obs. Linnæus remarks, that the tube of the corolla, though in most instances very short, in some spiked species is of considerable length. Mr. Brown particularly indicates *V. virginica* and *sibirica*, as having a tube longer than their five-cleft calyx, and hence belonging to Pæderota, if that genus, which moreover scarcely differs from Wulfenia, ought to be retained; see those articles. The *calyx* is five-cleft in some other species, as *multifida*, and several neighbouring ones, though others of the same tribe have a four-cleft calyx. Such a difference therefore furnishes merely, in this case, a specific, not a generic, distinction.

Veronica is a very natural genus. The *stem*, usually herbaceous, is in some few instances shrubby. *Leaves* opposite, simple, mostly undivided, sometimes many-cleft; in a few cases whorled; those which accompany the flowers, whether true *bracteas*, or the proper foliage of the plant, the flowers being axillary, are nearly all alternate. Partial *flower-stalks* alternate, single-flowered. *Calyx* more or less unequal. *Corolla* blue, rarely white or pale red, marked with simple, radiating lines, not reticulated. The species are very numerous, natives of the cold or temperate regions of Europe, America, New Holland, and New Zeeland. Seventeen are wild in Britain; about twenty-five exotic ones are cultivated in the gardens, being mostly perennial and hardy. We have several to add to those of Linnæus and Willdenow, and even to the more copious catalogue of Vahl, amounting to sixty-eight species. The fourteenth edition of Linn. Syst. Veg. contains but forty. They are commodiously and naturally arranged by their inflorescence.

Sect. 1. *Clusters terminal. Leaves more or less whorled.*

1. V. *sibirica.* Siberian Speedwell. Linn. Sp. Pl. 12. Willd. n. 1. Vahl n. 1. Ait. n. 1. (V. spicata altissima, foliis verticillatis; Am. Ruth. 20. t. 4.)—Cluster dense, with nearly sessile flowers. Tube of the corolla twice as long as the five-cleft calyx. Leaves from five to nine in a whorl, lanceolate, sessile.—Native of Siberia; sent to Kew by professor Thunberg, in 1779. A hardy perennial, not rare in curious gardens, flowering in July and August, and rising to the height of five feet. The numerously whorled, finely serrated, smooth *leaves*, and the long, dense, upright *spikes*, rather than *clusters*, of innumerable pale blue, often white, tubular *flowers*, with long, projecting, capillary *stamens* and *style*, well mark this fine species.

2. V. *virginica.* Virginian Speedwell. Linn. Sp. Pl. 13. Willd. n. 2. Vahl n. 2. Ait. n. 2. Pursh n. 1. "Hoffm. in Comm. Goett. v. 15. 112. t. 1." (V. virginiana procerior, foliis ternis, quaternis, &c.; Pluk. Phyt. t. 70. f. 2.)—Clusters obscurely whorled, with nearly sessile flowers. Tube of the corolla twice as long as the five-cleft calyx. Leaves four or five in a whorl, elliptic-lanceolate, stalked.—On calcareous hills of North America, in sunny exposures, flowering from July to September. Perennial. *Spikes* long; white or blush-coloured. On the mountains of Virginia, I observed a very tall-growing variety, with purple *flowers*, extremely beautiful. *Pursh.* This is usually of more humble stature than the preceding, and more frequent in gardens. The *leaves* are fewer in a whorl, broader, and, in our specimens, downy beneath. *Clusters*, or *spikes*, several at the top of the stem.

3. V. *foliosa.* Leafy Hungarian Speedwell. Vahl n. 3. "Waldst. et Kitaib. Hung. v. 2. 106. t. 102."—Leaves three in a whorl, ovate, doubly serrated. Calyx four-cleft. Native of Hungary. *Stem* about two feet high, erect, simple, hairy below. *Leaves* on short stalks, acute, veiny beneath; the lower ones downy, especially the rib and margin; uppermost rather lanceolate and smooth. Lower *clusters* three together; upper ones opposite or alternate. *Bracteas* linear. *Corolla* of a violet-blue. *Capsule* inversely heart-shaped. *Vahl.*

4. V. *maritima.* Sea-side Speedwell. Linn. Sp. Pl. 13. Fl. Lapp. ed. 2. 5. Vahl n. 4. Willd. n. 4. Fl. Dan. t. 374? (V. mas surrecta elatior; Barrel. Ic. t. 891. V. spuria;

ſpuria; Poit. et Turp. Pariſ. 19. t. 18. Lyſimachia cæruleo flore; Cluſ. Hiſt. v. 2. 52. L. cærulea hortenſis; Lob. Ic. 344. Ger. Em. 477. f. 9.)—Cluſters terminal, with nearly ſeſſile flowers. Leaves ſtalked, three in a whorl, unequally and ſharply ſerrated.—Native of barren dry ground, near the ſea-coaſt, in the north of Europe. Linnæus obſerved it frequently on the confines of the Lapland Alps, near the North ſea, though no where more abundantly than on the ſea-coaſt near Tornea. We muſt take his plant as a fixed point, by which to determine this much-confuſed ſpecies; which, though often ſeen in gardens, flowering in the early part of ſummer, does not find a place in the *Hort. Kew.* The old wooden cut, which is the very ſame in all the old authors above cited, repreſents the Linnæan plant moſt perfectly, even better than the plate of *Fl. Dan.*, whoſe leaves are too broad, and too finely ſerrated. The *root* of *V. maritima* is perennial, and ſomewhat creeping. *Stems* two feet high, erect, ſimple, leafy, round below, quadrangular above, finely downy, though occaſionally ſmooth in a garden, the angles being the firſt part that becomes ſo. *Leaves* three or four in a whorl, on elongated rather ſlender ſtalks, ſpreading and rather dependent, linear-lanceolate, pointed, two and a half or three inches long, copiouſly, deeply, unequally, and very ſharply ſerrated, either finely downy, or quite ſmooth, on both ſides; accompanied by axillary tufts of a few linear, or awlſhaped, ſmall, ſerrated leaves. *Flowers* blue, in one large, central, denſe ſpike, accompanied by ſeveral ſurrounding ſmaller ones, from the boſoms of the uppermoſt leaves, ſometimes terminating ſmall branches. *Calyx* unequally four-cleft, narrow, longer than the tube of the *corolla.*—A ſingular variety, as it is ſuppoſed, of this is deſcribed in Linn. Amoen. Acad. v. 3. 35. t. 2, by the name of *V. ſpuria*, and preſerved in the Linnæan herbarium. The *leaves* are deeply and variouſly pinnatifid and jagged; *flowers* ſmaller than uſual in *V. maritima*, and always barren. Linnæus conceived it to be a mule, from the pollen of *Verbena officinalis*, which grew near the *Veronica maritima* in his garden. We can neither confirm nor diſprove this opinion. The plant muſt not be confounded with *V. ſpuria*, hereafter deſcribed.

Three dried ſpecimens from Ehrhart's *Herbæ* are before us, *V. glabra*, n. 11; *nitida*, n. 21; and *elatior*, n. 31. The firſt is conſidered by Willdenow as the identical *V. maritima*, and indeed agrees well with *V. recta cærulea*, Beſl. Eyſt. vern. ord. 5. t. 10. f. 2. cited by C. Bauhin as the ſame with our *maritima;* but the *leaves* are ſhorter and more ovate, with far leſs taper ſerratures than the Linnæan ſpecimen, or the authentic old wooden cuts; being more of the ſhape of Fl. Dan. t. 374, though with much broader ſerratures. The *ſtem* and *leaves* are very ſmooth; partial *flower-ſtalks* elongated and ſlender, nearly ſmooth; tube of the *corolla* about twice as long as the *calyx*, which laſt ſeems an important diſtinction, ſhould it prove conſtant.—*V. nitida*, Ehrh. n. 21, is the top of a large luxuriant plant, whoſe very ſmooth *leaves* are oppoſite, or aggregate, not diſtinctly whorled, though its lower ones perhaps might; their form broad-ovate, ſtrongly and ſharply ſerrated, their length one and a half or two inches. *Cluſters* numerous and long; the partial *flower-ſtalks* a little downy, longer than the *calyx*, which is full as long as the tube of the *corolla*. If theſe characters may be depended on, as in other plants, the two ſpecimens in queſtion muſt be diſtinct from each other and from *maritima*. *V. elatior*, n. 31, moſt unaccountably referred by Willdenow to *longifolia*, is more near *maritima* than either of the others, having merely broader, and leſs deeply ſerrated, *leaves*, and agreeing as nearly with Fl. Dan. t. 374, as a cultivated ſpecimen uſually does with a wild one. Its *inflorescence* and *flowers* preciſely reſemble thoſe of the Linnæan ſpecimen of *maritima*. This is ſurely *V. ſpicata* of Rivin. Monop. Irr. t. 97.

5. V. *crenulata*. Notch-flowered Speedwell. "Hoffm. Phytogr. Blätt. faſc. 1. 95." Vahl n. 5.—"Leaves three in a whorl, or oppoſite, oblong-lanceolate, ſerrated, downy like the ſtem. Corolla finely crenate."—A garden plant, perennial, two feet high, with ſcattered *branches* in the upper part of the *ſtem*. Lower *leaves* ſtalked, oppoſite, rarely three together; upper nearly ſeſſile, alternate, pretty equally and acutely ſerrated. *Cluſters* hardly ſix inches long. *Bracteas* lanceolate. *Calyx* four-cleft, hairy at the edge. *Corolla* deep blue, hairy in the throat; its ſegments waved, minutely crenate. *Capſule* roundiſh-ovate, ſmooth, of four valves. *Hoffmann, Vahl.* We know nothing of this ſpecies, having ſeen no ſpecimen anſwering to its name or character.

6. V. *ſpuria*. Spurious Speedwell. Linn. Sp. Pl. 13. Willd. n. 3. Vahl n. 6. Gmel. It. v. 1. 169. t. 39. (V. ſpicata anguſtifolia; Bauh. Pin. 246, *Herb. Sherard.* V. recta vulgaris major; Cluſ. Hiſt. v. 1. 347. V. recta herbariorum; Lob. Ic. 473. V. aſſurgens ſive ſpicata; Ger. Em. 628, according to C. Bauhin; but the ſame cut is in Cluſius, v. 1. 346, who probably has the ſame ſpecies twice.)—Leaves three in a whorl, or oppoſite, on ſhort ſtalks, lanceolate, equally ſerrated, ſomewhat downy; contracted at each end. Cluſters lax.—Native of Siberia and the ſouth of Europe. About the ſtature of the laſt, but the *ſtem* is round to the top; *leaves* ſhorter, equally, though ſtrongly ſerrated, on much ſhorter *ſtalks;* never more than three in a whorl, often oppoſite only. *Calyx* the length of the tube. Vahl records an opinion of our learned friend Dr. A. Afzelius, that this may be a three-leaved variety of *V. longifolia*. Some botaniſts of the ſouth of Europe, from whom we have ſpecimens, have conceived the ſame idea. But the real *longifolia* is totally diſtinct, as we ſhall hereafter ſhew.

7. V. *paniculata*. Panicled Speedwell. Linn. Sp. Pl. 18. Willd. n. 45. Vahl n. 7. Ait. n. 31. ("V. dentata; Schmidt Bohem. v. 1. 31." V. anguſtifolia, floribus paniculatis; Amm. Ruth. 24.)—Leaves ſtalked, three in a whorl, lanceolate, equally ſerrated, ſmooth. Stem aſcending, panicled with numerous ſimple cluſters.—Native of Siberia, Tartary, and Bohemia. A hardy perennial in this country, introduced by Mr. Hunnemann, in 1797, yet it has never been figured. The *herbage* is ſmooth. *Stem* round, not quite erect. *Leaves* an inch or more in length, narrow, acute, rather diſtantly ſerrated, on ſhortiſh ſtalks. *Cluſters* lax, many-flowered, ſmooth, on long, axillary, partly leafy, ſtalks, making a handſome terminal panicle. *Flowers* blue. Vahl is certainly right in removing this ſpecies to the preſent ſection, near its moſt natural allies. It is, however, very diſtinct from the laſt.

8. V. *complicata*. Folded-leaved Speedwell. "Hoffm. Phytogr. Blätt. faſc. 1. 98." Vahl n. 8.—"Leaves whorled, or oppoſite, linear-lanceolate, folded, toothed; teeth thickened."—Native of Europe. Perennial. *Stem* two feet high, erect, ſlightly zigzag, round, downy in the upper part; the flowering branches nearly oppoſite. *Leaves* moſtly oppoſite, rarely three in a whorl, ſpreading, reflexed; the radical ones elliptical, ſomewhat hoary, unequally toothed. *Bracteas* linear-lanceolate. *Calyx* four-cleft, downy. *Corolla* blue, hairy in the throat. *Capſule* inverſely heart-ſhaped, ſmooth, with four valves. *Hoffm. Vahl.*

9. V. *brevifolia*. Short-leaved Speedwell. "Waldſt. et Kitaib. Hung. t.—." Marſch. à Bieberſt. Taur.-Caucaſ. v. 1.

v. 1. 6.—" Leaves three in a whorl, broadly lanceolate, downy, sharply and finely serrated. Calyx and bracteas very short."—Native of stony hills of Caucasus, flowering in May and June. Perennial. Whole herb clothed with fine, rather glaucous, pubescence. Akin to *V. spuria* in *flowers* and *inflorescence*, but the *leaves* are much shorter and broader, with sharper more copious serratures. *Marsch.*

Sect. 2. *Clusters or spikes terminal. Leaves opposite.*

10. V. *longifolia*. Long-leaved Speedwell. Linn. Sp. Pl. 13. Fl. Suec. ed. 2. 4. Willd. n. 5, excluding Ehrhart's synonym. Vahl n. 9. Ait. n. 6? " Schrad. Veron. 26. t. 2. f. 1?" (V. spicata latifolia; Bauh. Pin. 246. Ger. Em. 628. V. prima erectior latifolia; Clus. Hist. v. 1. 346. V. major latifolia, foliis splendentibus et non splendentibus; Bauh. Hist. v. 3. 283.)—Leaves opposite, ovate, pointed, doubly and sharply serrated, smooth, on very short stalks. Clusters aggregate, erect. Calyx ovate, shorter than the tube of the corolla.—Native of Sweden, Tartary and Austria. Perennial. *Stems* erect, two feet high, leafy, round, either smooth, or finely downy, with minute recurved hairs. *Leaves* two and a half inches long, and nearly one broad, with extremely numerous and sharp, unequal, and often double, serratures. *Footstalks* broad and very short; to the upper leaves scarcely any. *Clusters* rather dense, all erect and crowded, forming a sort of pyramidal panicle. Partial *flower-stalks* slightly downy, for the most part longer than the *calyx*, whose four segments are broad, ovate, and nearly equal. Tube of the *corolla* about twice as long as the calyx, and equal to the limb.—Such is the real *V. longifolia*, the Swedish plant of Linnæus, for which, if we do not greatly err, authors have mistaken the *maritima* of Fl. Dan. t. 374. This latter is actually quoted for *longifolia*, by Mr. Dryander in Hort. Kew. on the authority, we presume, of Schrader, whose work is not within our reach, and therefore we refer to his plate with hesitation. That the above-mentioned plant of Fl. Dan. may be a distinct species from *maritima*, we are readily disposed to allow. But that both of them are perfectly different from our true *longifolia*, and essentially distinguished from it by the much narrower, and more unequal, segments of their *calyx*, to say nothing of the *leaves* and *footstalks*, is certain. A good figure of the *longifolia* is wanting, John Bauhin's being the best that we can find; as the others are very defective in their foliage. Vahl's description answers better to the so often mentioned *maritima* of Fl. Dan. than to the real *longifolia*. His variety β, *V. spicata urticæ folio*, Amm. Ruth. 26, though cited likewise as a variety by Linnæus, appears to be the true plant, the description agreeing precisely, except the " solitary spike."

11. V. *incana*. Hoary Speedwell. Linn. Sp. Pl. 14. Willd. n. 6. Vahl n. 10. Ait. n. 3. " Hoffm. in Comm. Goett. v. 15. 123. t. 6." Marsch. Taur.-Caucas. v. 1. 7. (V. spicata lanuginosa et incana, floribus cæruleis; Amm. Ruth. 21.)

β. V. neglecta; Vahl n. 11.

Hoary and densely downy. Spike terminal, mostly solitary. Leaves opposite; lower ones stalked, crenate or serrated; uppermost entire, sessile, tapering at the base.—Native of the rocky summits of mountains in Siberia and Tauria, flowering in June. An elegant plant, a foot high, its white pubescence being strikingly contrasted with the dense *spike*, rather than *cluster*, of dark blue *flowers*. *Calyx* cottony, with four oblong unequal segments. The *leaves* certainly vary in acuteness, as well as in the strength of their serratures, and we gladly profit of the hint given by the learned author of the *Flora Taurico-Caucasica*, to consider Vahl's *V. neglecta*, which is frequent in gardens, as a mere variety. Still we do not concur with the same great authority in thinking the pubescence alone distinguishes this species from *V. spicata*; even though specimens of luxuriant *spicata*, as they appear to us, are pinned by Linnæus in his herbarium to the genuine wild *incana*.

12. V. *spicata*. Spiked Speedwell. Linn. Sp. Pl. 14. Willd. n. 7. Vahl n. 12. Fl. Brit. n. 1. Engl. Bot. t. 2. Poit. et Turp. Paris. 19. t. 19. Fl. Dan. t. 52. (V. spicata minor; Bauh. Pin. 247. Vaill. Paris. t. 33. f. 4. V. recta minima; Clus. Hist. v. 1. 347. Ger. Em. 627. V. spicata recta minor; Bauh. Hist. v. 3. 282.)

β. V. altera erecta angustifolia: Clus. Hist. v. 1. 346. (V. spicata recta major; Bauh. Hist. v. 3. 282. V. assurgens, sive spicata; Ger. Em. 628.)

Spike terminal, mostly solitary. Leaves opposite, stalked, bluntish, with shallow serratures, somewhat downy; the extremity entire. Stem ascending, unbranched.—Native of open, chalky, mountainous, or alpine pastures, throughout most parts of Europe, from Sweden to Greece, flowering from July to September. The *root* is creeping, perennial, a little woody. *Stems* from three to ten or fourteen inches high, each bearing usually a single dense spike of dark-blue *flowers*; but the luxuriant variety β has several *spikes*. The lower *flowers* are not sessile. The segments of the *calyx* are oblong and downy. The whole *herb* is more or less downy, or finely hairy, but by no means cottony, or hoary, in the manner of the last. The *leaves* vary in breadth, and are sometimes almost entire.

13. V. *hybrida*. Welsh Speedwell. Linn. Sp. Pl. 14. Willd. n. 8. Vahl n. 13. Fl. Brit. n. 2. Engl. Bot. t. 673. (V. spicata cambrobritannica, bugulæ subhirsuto folio; Raii Syn. ed. 3. 278. t. 11.)—Spikes terminal. Leaves opposite, elliptical, obtuse, roughish, unequally and bluntly serrated. Stem nearly erect.—Native of several parts of Europe, but rare. It is found in the Welsh county of Montgomery, as well as in Lancashire. Linnæus suspected this might be a mule between *V. officinalis* and *spicata*, though surely without authority. It is most akin to the last, but twice as large in every part, with rougher *leaves* and *stem*, nor does it alter by culture. The *spikes*, or rather *clusters*, are very long and dense, seldom solitary, and consist of innumerable blue *flowers*.

14. V. *incisa*. Cut-leaved Speedwell. Ait. ed. 1. v. 1. 19. ed. 2. n. 9. Willd. n. 11. Vahl n. 14. " Schrad. Veron. 33."—Clusters terminal. Bracteas as long as the calyx and flower-stalk. Segments of the calyx linear-lanceolate, longer than the tube of the corolla. Leaves lanceolate, deeply pinnatifid, smooth.—Native of Siberia. The whole habit of this species is very slender. *Stem* branched, about two feet high, leafy, round, slightly downy. *Leaves* linear-lanceolate, or variously pinnatifid and cut, very narrow, with axillary tufts of still narrower and much smaller ones. *Clusters* solitary at the ends of the branches, lax, many-flowered. Partial *stalks* capillary, a little downy, shorter than the *calyx*, which is four-cleft, unequal, smooth. *Bracteas* linear, channelled, smooth, various in length, but, in the lower part of the cluster at least, extending beyond the points of the calyx. *Corolla* blue, with acute segments.

15. V. *laciniata*. Jagged-leaved Speedwell. Ait. ed. 1. v. 1. 19. ed. 2. n. 8. Willd. n. 10. Vahl n. 15. " Schrad. Veron. 32." (" V. spuria; Junghans Ic. Rar. cent. 1. fig. 2, excluding the synonyms." *Willd.*)—Clusters terminal. Bracteas as long as the flower-stalk. Segments of the calyx ovato-lanceolate, as long as the tube of the corolla. Leaves linear, pinnatifid.—Native of Siberia. Akin to the last, but the shorter more ovate segments of the *calyx* afford a clear distinction. The *clusters* are very long, and their

their lower *bracteas*, much longer than the upper, partake of the nature of leaves.

16. V. *pinnata*. Wing-leaved Speedwell. Linn. Mant. 24. Willd. n. 9. Vahl n. 16. Ait. n. 7. "Schrad. Veron. 32. Laxmann in Act. Petrop. ann. 1770. 553. t. 29. f. 1. Hoffm. in Comm. Goett. v. 15. 130. t. 10."—Clusters terminal. Segments of the calyx lanceolate. Leaves pinnatifid, with linear, acute, divaricated, entire or toothed, segments.—Found by Laxmann in Siberia, and by Dr. Sibthorp on mount Athos.—Like the two last, this is a hardy perennial in the gardens, flowering in June and July; but though they have been introduced about forty years, they are not become common. The *foliage* of the present species abounds with copious, narrow, often capillary, segments. *Clusters* numerous, from a span to a foot long, consisting of a profusion of handsome sky-blue *flowers*, whose *calyx* is smooth, almost equally four-cleft. *Bracteas* linear, various in length. *Capsule* inversely heart-shaped, a little longer than the permanent calyx, tumid, with four valves.

17. V. *bellidioides*. Daisy-leaved Speedwell. Linn. Sp. Pl. 15. Mant. 316. Willd. n. 21. Vahl n. 17. Ait. n. 12. (V. n. 543. t. 15. f. 1; Hall. Hist. v. 1. 235. V. alpina, bellidis folio, hirsuta; Bauh. Prodr. 116.)—Cluster corymbose, terminal, hairy, of few flowers. Leaves obovate, crenate. Stem simple, ascending. Capsule elliptical, abrupt, emarginate.—Native of the Alps and Pyrenées, flowering in June and July. This is one of those numerous alpine plants, which were first introduced to the knowledge of British cultivators by Dr. Pitcairn and Dr. Fothergill, who in 1775 sent a skilful gardener abroad for that purpose. *V. bellidioides* is perennial, with a creeping *stem*, throwing up perfectly simple flowering-branches, a finger's length, bearing two or three pair of opposite spatulate *leaves*, smaller than the more numerous radical ones. The whole of the herbage is more or less hairy. *Flowers* pale greyish-blue, from five to eight in a terminal viscid *corymb*, afterwards elongated and racemose.

18. V. *gentianoides*. Gentian-leaved Speedwell. Vahl n. 18. Symb. v. 1. 1. Willd. n. 22. Ait. n. 13. Sm. Tr. of Linn. Soc. v. 1. 194. Fl. Græc. Sibth. v. 1. 5. t. 5. Curt. Mag. t. 1002. Venten. Malmaif. t. 86. (V. orientalis erecta, gentianellæ foliis; Tourn. Cor. 7. V. erecta, blattariæ facie; Buxb. Cent. 1. 23. t. 35.)—Cluster corymbose, terminal, hairy. Radical leaves lanceolate, somewhat crenate, smooth.—Native of Cappadocia, and the mountains of Taurida and Caucasus, as well as of the Bithynian Olympus. Hardy, perennial, and not uncommon in gardens, flowering in May and June. But this little alpine plant, originally four or five inches high, by culture rises to the height of two feet, with a lax habit, and long cluster of numerous *flowers*. It may always be known by its thick, smooth, acute *leaves*, with a pale cartilaginous edge, resembling the foliage of *Gentiana acaulis*. The *corolla* is large, beautifully streaked; purplish-blue in a wild state; blueish-white in gardens.

19. V. *thymifolia*. Thyme-leaved Speedwell. Sm. Fl. Græc. Sibth. v. 1. 5. t. 6. Prodr. n. 19.—Cluster terminal, corymbose. Leaves revolute, hoary. Stems somewhat shrubby, diffuse. Lobes of the capsule divaricated.—Discovered by Dr. Sibthorp on the summits of mountains in Crete, flowering on the first melting of the snow. A shrubby little plant, whose *stems* are only three or four inches high, slightly branched, clothed with thyme-like, opposite, hoary, elliptical, entire, revolute *leaves*, tapering down into short *footstalks*. *Flowers* blue, very pretty, in *clusters* not an inch long. *Capsule* hairy, inversely heart-shaped, with distant lobes.

20. V. *fruticulosa*. Flesh-coloured Shrubby Speedwell. Linn. Sp. Pl. 15. Mant. 316. Willd. n. 24. Vahl n. 19. Fl. Brit. n. 5. Engl. Bot. t. 1028. Wulf. in Jacq. Coll. v. 4. 229. t. 5. (V. n. 545; Hall. Hist. v. 1. 235. t. 16. f. 1.)—Cluster terminal, elongated, many-flowered. Leaves elliptic-lanceolate. Stems erect, somewhat shrubby. Capsule ovate, of four valves. Native of the mountains of Austria, Scotland, Switzerland, and the Pyrenées, flowering in July. The *stems*, at least their flowering *branches*, are quite erect, from four to six inches high. *Leaves* above an inch long, a little downy at their edges and veins, sometimes quite entire, sometimes crenate or serrated. *Flowers* numerous, in a spiked rather than corymbose *cluster*, pink or flesh-coloured, never blue. *Capsule* abrupt or rather acute, soon splitting into four valves.

21. V. *saxatilis*. Blue Rock Speedwell. Linn. Suppl. 83. Willd. n. 25. Vahl n. 20. Fl. Brit. n. 4. Engl. Bot. t. 1027. Bauh. Hist. v. 3. 284. Dicks. Crypt. fasc. 2. 29. (V. fruticulosa; Sm. Tr. of Linn. Soc. v. 1. 191. Fl. Dan. t. 342. V. n. 545 β; Hall. Hist. v. 236. V. tertia fruticans; Clus. Hist. v. 1. 347. V. fruticans serpyllifolia; Ger. Em. 628.)—Cluster terminal, corymbose, of few flowers. Leaves elliptical. Stems spreading, somewhat shrubby. Capsule ovate, of four valves.—Native of the mountains of Norway, Scotland, Austria, Switzerland, and the Pyrenées, more frequent than the preceding, flowering in July. This is akin to the last, with which many botanists, even the greatest, have confounded it. The *stems* however are diffuse; *leaves* shorter and rounder; *flowers* of a rich ultramarine blue, and much fewer in each short corymbose cluster. The *bracteas* too are rounder and shorter in proportion to the *partial stalks*. The flowering branches of both these species are herbaceous and annual, though the main stem of both is shrubby and perennial, forming woody entangled tufts.—*V. nummularia*, Gouan. Illustr. 1. t. 1. f. 2, appears by original specimens from the author to be, as Willdenow and Vahl make it, a dwarf variety of the *saxatilis*, with small, rounded, crowded *leaves*. *V. pygmæa*, Schranck Salisb. n. 11. t. 1. f. 1, seems scarcely different from the *nummularia*.

22. V. *alpina*. Alpine Speedwell. Linn. Sp. Pl. 15. Fl. Lapp. ed. 2. 7. t. 9. f. 4. Willd. n. 26. Vahl n. 21. Fl. Brit. n. 6. Engl. Bot. t. 484. Fl. Dan. t. 16. (V. pumila; Allion. Pedem. v. 1. 75. t. 22. f. 5. Spec. 19. t. 3. f. 3. V. integrifolia; Willd. n. 27. V. n. 544; Hall. Hist. v. 1. 235. t. 15. f. 2.)—Cluster terminal, dense, corymbose. Leaves ovate, smoothish, somewhat serrated. Calyx fringed. Stem ascending, simple.—Native of the alps of Europe, from Lapland to Savoy, flowering in July and August. Vahl thinks this *Teucrium sextum* of Clus. Hist. v. 1. 350, with the description of which it well agrees, but there being no figure, we cannot absolutely decide. In general, though not unfrequent in boggy alpine spots, among trickling rills, in Switzerland and Savoy, it seems to have almost totally escaped the notice of the earlier writers. The *root* is perennial, rather creeping. *Stems* procumbent at the base, then ascending obliquely, a little zig-zag, round, leafy, from two to five inches long. *Leaves* about an inch long, more or less broadly elliptical, rarely hairy. *Flowers* small, of a bright light blue, with a white tube, shorter than the four ovate, nearly equal, hairy segments of the *calyx*. *Capsule* oval-heartshaped, of two compressed valves.—We reduce to this species, on the authority of Vahl, the *V. integrifolia* of Schranck and Willdenow, of which no specimen has fallen in our way; but we find among those of indubitable *V. alpina* many that answer to their descriptions.

23. V. *ferpyllifolia*. Smooth Speedwell, or Paul's Betony. Linn. Sp. Pl. 15. Willd. n. 28. Vahl n. 22. Fl. Brit. n. 7. Engl. Bot. t. 1075. Curt. Lond. fasc. 1. t. 3. Purfh n. 4. Fl. Dan. t. 492. (V. humifusa; Dickf. Tr. of Linn. Soc. v. 2. 288. V. minima repens; Rivin. Monop. Irr. t. 99. f. 1. V. minor; Ger. Em. 627. V. minor ferpyllifolia; Lob. Ic. 472.)—Clufter terminal, fomewhat fpiked. Leaves ovate, flightly crenate, three-ribbed, fmooth. Capfule inverfely heart-fhaped, fhorter than the ftyle.—Native of Europe and North America, in paftures, and by road-fides, very frequent, flowering in May and June. The herbage in moift fituations is fmooth, fhining, and rather juicy; in dry open or hilly ground it becomes downy or hairy. The *roots* are perennial. *Stems* from two to twelve inches long, erect or proftrate. *Clufters* elongated, lax, with ovate *bracteas*. *Corolla* fmall, elegantly variegated with bright blue and white, ftreaked with dark blue.

24. V. *tenella*. Little Round-leaved Speedwell. Allion. Pedem. v. 1. 75. t. 22. f. 1. Willd. n. 29. Vahl n. 23. Symb. v. 3. 5.—"Leaves roundifh, fomewhat rugged and crenate, all ftalked. Stem creeping, villous as well as the calyx."—Native of the Pyrenean mountains, and the alps of Savoy. This is faid to differ but little from the laft. Indeed Plukenet's t. 233. f. 4, cited for the prefent, can hardly be any thing elfe than the *ferpyllifolia*. Allioni defcribes the *leaves* as lefs firm and even than that fpecies, but the creeping *ftem* and lefs denfe *clufter*, are characters of no moment. We have not examined the plant.

25. V. *telephiifolia*. Orpine-leaved Speedwell. Vahl n. 24. (V. orientalis, telephii folio; Tourn. Cor. 7.)—"Leaves obovate, nearly entire. Stem creeping."—Gathered in Armenia by Tournefort, and defcribed by Vahl from his herbarium. *Stems* thread-fhaped, fmooth. *Leaves* ftalked, hardly half the length of the nail, very obtufe, fmooth, with one or two obfcure notches about the extremity; acute at the bafe. *Flowers* (and we prefume *inflorefcence*) wanting in the fpecimen. *Vahl.*

26. V. *ruderalis*. Round-leaved Peruvian Speedwell. Vahl n. 25. ("V. ferpyllifolia; Fl. Peruv. v. 1. 6.")—"Leaves roundifh, crenate, obfcurely five-ribbed; the upper ones flightly fringed and entire. Stem creeping."—Native of wafte ground, borders of fields, and cool watery fituations, in Peru. Perennial. *Stems* many, diffufe, thread-fhaped, purplifh; downy in the upper part. Lower *leaves* on fhort ftalks, fpreading; upper feffile. Partial *flower-ftalks* thread-fhaped, the length of the *bracteas*. *Corolla* violet; its fmalleft fegment white. *Vahl.* This is evidently very near *V. ferpyllifolia*.

Sect. 3. *Clufters lateral.*

27. V. *parviflora*. Small-flowered Shrubby Speedwell. Vahl n. 26. Symb. v. 3. 4. Willd. n. 16.—Clufters axillary, about the ends of the branches. Segments of the calyx ovate, fringed. Leaves linear-lanceolate, entire, pointed. Stem fhrubby.—Gathered by fir Jofeph Banks and Dr. Solander in New Zeeland. They gave a fpecimen to the younger Linnæus, by the name of *V. floribunda*. The *ftem* is perhaps feveral feet in height, with forked, twifted, round, fcarred, woody *branches*, leafy only while young. *Leaves* crowded, feffile, croffing each other in pairs, from one to two inches long, very fmooth and even, fingle-ribbed, deciduous. *Clufters* axillary, and fomewhat terminal, ftalked, denfe, many-flowered, nearly fmooth, longer than the leaves. *Flowers* fmall, we believe them to be white. *Bracteas* minute, fringed. *Calyx* the length of the tube of the *corolla*, and only one-third as long as the ovate, fmooth, finally four-valved and quadrangular *capfule*. The *ftyle* is remarkably long and capillary, deciduous.

This is one among many fhrubby or arborefcent white-flowered fpecies, referrible to Juffieu's and Commerfon's genus of *Hebe*, which are indeed fo unlike moft *Veronicæ* in habit, that one could wifh their fructification afforded any generic diftinction. They ferve to approximate the prefent genus, by fome points of refemblance, to the *Jafmineæ*.

28. V. *macrocarpa*. Large-fruited Shrubby Speedwell. Vahl n. 27. Symb. v. 3. 4.—Clufters axillary, about the ends of the branches, erect. Segments of the calyx lanceolate. Leaves lanceolate, entire, flat. Stem fhrubby.—Native of New Zeeland. The *leaves* are four inches long, fmooth and even, without lateral ribs, or veins. Tube of the *corolla* twice, and *capfule* thrice, the length of the *calyx*. *Vahl.*

29. V. *falicifolia*. Willow-leaved Shrubby Speedwell. Forft. Prodr. 3. Vahl n. 28. Symb. v. 3. 4. Willd. n. 15.—Clufters axillary, about the ends of the branches, drooping; partial ftalks aggregate. Segments of the calyx lanceolate. Leaves lanceolate, entire; tapering at each end. Stem fhrubby.—Gathered in New Zeeland by fir Jofeph Banks and Dr. Solander. This appears to be nearly related to the laft, but the *leaves* are narrower at the bafe. In our fpecimen they are little more than two inches long, fcarcely perceptibly undulated at the very edge. *Clufters* longer than the leaves, their capillary *partial ftalks* very numerous, feveral from the fame point, each accompanied by its own little fhort lanceolate *bractea*. Tube of the *corolla* twice the length of the *calyx*; fegments of its limb elliptic-lanceolate, acute; not, as in the two preceding, obtufe. *Capfule*, according to Vahl, oblong and acute, twice as long as the calyx.

30. V. *elliptica*. Elliptic-leaved Shrubby Speedwell. Forft. Prodr. 3. Vahl n. 29. Willd. n. 13.—Clufters axillary, about the ends of the branches, fimple, of few flowers. Segments of the calyx ovate, acute. Leaves elliptic-lanceolate, pointed, entire, flightly revolute. Stem fhrubby.—Native of New Zeeland, from whence Mr. Menzies has favoured us with a fpecimen in feed. No writer has yet given any detailed defcription of this fpecies. Its woody *branches* are rough with very protuberant fcars, where the leaves have been, and when young are quadrangular. *Leaves* crowded, croffing each other in pairs, about an inch long, acute at each end, fingle-ribbed, fmooth, very flightly revolute, or reflexed at the margin. *Clufters* of not more than fix or eight *flowers*, at firft probably fhort and denfe; when in fruit hardly longer than the leaves; their *ftalks* all angular and fmooth. *Bracteas* minute, acute, permanent. The *corolla* we have not feen. The permanent *calyx* is fmooth, acute, half the length of the ovate, acute, tumid, four-valved *capfule*.

31. V. *decuffata*. Crofs-leaved Shrubby Speedwell. Ait. n. 20. Vahl n. 31. Willd. n. 19. Curt. Mag. t. 242.—Clufters axillary, about the ends of the branches, fimple, of few flowers. Segments of the calyx ovate. Leaves elliptical, obtufe, entire, flightly revolute. Stem fhrubby.—Native of Falkland iflands, and the ftraits of Magellan; yet it requires the fhelter of a greenhoufe in this country. Dr. Fothergill is faid to have firft cultivated this fhrub in 1776. It flowers, but not freely, in July and Auguft, and the foliage is evergreen. This fpecies is fo nearly related to the laft, that they muft neceffarily be placed next to each other, nor are we well affured of a fpecific diftinction between them. The *leaves* of the prefent are indeed much fhorter, rounder, and lefs pointed, but their figure is not invariable. The *inflorefcence* is precifely fimilar. The *flowers* are white, large and elegant, obferved by Mr. Curtis to have a moft delicious fragrance, fimilar to that of *Olea fragrans*; another

another point of resemblance to the *Jasminea*, see n. 27. The same writer justly observes, that the segments of the *corolla* are more equal than is usual in *Veronica*, and sometimes vary to five. The *capsule* is oval, scarcely emarginate.

32. V. *formosa*. Elegant Shrubby Speedwell. Brown n. 1.—Clusters corymbose, axillary, of few flowers. Leaves lanceolate, entire; acute at the base. Stem shrubby. Branches with two opposite hairy lines.—Gathered by Mr. Brown in Van Diemen's island. The *leaves* are evergreen, in pairs crossing each other, very smooth. *Brown*.

33. V. *catarracta*. Water-fall Shrubby Speedwell. Forst. Prodr. 3. Vahl n. 30. Ait. n. 12.—Clusters axillary, elongated, lax. Leaves stalked, lanceolate, distantly serrated. Stem somewhat shrubby.—Gathered by Forster in New Zeeland, we presume near some remarkable cascade. The *leaves* are an inch long, acute at each end, smooth; paler beneath. *Clusters* from the bosoms of the upper leaves, four inches long, with smooth *flower-stalks* in distant pairs. *Calyx* with four awl-shaped segments, shorter than the oblong *capsule*. *Vahl*.

34. V. *labiata*. Labiated Speedwell. Brown n. 2. Ait. Epit. 376. Curt. Mag. t. 1660. (V. Derwentia; Littlejohn in Andr. Repos. t. 531.)—Clusters axillary, elongated. Leaves sessile, ovato-lanceolate, taper-pointed, unequally serrated.—Native of Van Diemen's island, and the south coast of New Holland, flowering with us most part of the summer. It is perennial and herbaceous, increased by parting the roots, but hitherto treated as a greenhouse plant; though, not being shrubby, it will probably bear our climate. The *stems* are simple, erect, about two feet or more in height, round, leafy, very smooth. *Leaves* opposite, clasping the stem by a sort of dilatation, scarcely to be termed a footstalk, veiny, quite smooth, three or four inches long, acutely and copiously serrated. *Clusters* numerous, opposite, about the top of the stem, ascending, stalked, many-flowered, rather dense, a little downy; their *partial stalks* sometimes aggregate. *Bracteas* awl-shaped. Segments of the *calyx* four, lanceolate: those of the pale blue *corolla* elliptic-lanceolate, unequal, acute. *Capsule* of four valves.

35. V. *aphylla*. Naked-stalked Speedwell. Linn. Sp. Pl. 14. Willd. n. 20. Vahl n. 32. Ait. n. 11. (V. n. 541; Hall. Hist. v. 1. 234. V. alpina pumila, caule aphyllo; Bocc. Mus. 17. t. 1, and t. 9. V. saxatilis parva, caulibus nudis; Pluk. Phyt. t. 114. f. 3. Segu. Veron. v. 1. 241. t. 3. f. 2. Teucrium minimum; Clus. Hist. v. 1. 350.)

β. V. Kamtchatica; Linn. Suppl. 83. (" V. grandiflora; Gærtn. Nov. Comm. Petrop. v. 14. p. 1. 531. t. 18. f. 1." *Vahl*.)

Leaves obovate, crenate, hairy. Flower-stalks erect, naked, thrice as long as the branches, about three-flowered.—Native of alpine situations in the south of Europe, and north of Asia; not uncommon on the mountains of Switzerland and the north of Italy, flowering in July; but it has never been found in Britain or Ireland. The perennial trailing *stems* throw up several short leafy *branches*, about an inch in length. *Leaves* crowded, opposite, stalked, usually an inch long, sometimes much less, bluntish, with numerous shallow notches; their pubescence finely jointed. *Flower-stalks* solitary, near the top of each branch, two or three inches long, each bearing two or three light-blue *flowers*, on slender downy partial stalks, accompanied by oblong obtuse *bracteas*. *Calyx* hairy, in four obovate segments. *Capsule* twice the length of the calyx, obovate, emarginate, thin, compressed, hairy. The variety β differs merely in the somewhat larger size of every part; the pubescence being not more articulated in this than the common *V. aphylla*, as we have long ago remarked; Tr. of Linn. Soc. v. 1. 190.

36. V. *Beccabunga*. Brooklime Speedwell. Linn. Sp. Pl. 16. Willd. n. 30. Vahl n. 33. Fl. Brit. n. 8. Engl. Bot. t. 655. Curt. Lond. fasc. 2. t. 3. Woodv. Med. Bot. t. 7. Pursh n. 5. Fl. Dan. t. 511. (Beccabunga; Rivin. Monop. Irr. t. 100. Anagallis seu Becabunga; Ger. Em. 620. Sium; Fuchs. Hist. 725.)—Clusters lateral. Leaves elliptical, flat. Stem creeping.—Native of clear ditches, and limpid streams, throughout Europe, from Sweden to Greece, as well as in North America, flowering in June and July. Perennial. *Stems* procumbent or floating in their lower part, sending out long fibrous radicles from the joints; round, succulent, smooth and shining, like every other part of the herb, and extending two or three feet. *Leaves* slightly serrated, of a bright rich green, from one to two inches long, on short broad stalks. *Clusters* axillary, opposite, stalked, longer than the leaves, of several, not very brilliant, blue *flowers*. Segments of the *calyx* ovate, as long as the roundish, emarginate *capsule*. De Theis says, the old name *Beccabunga* is corrupted from *Bach-punghen*, the German appellation of this plant; *bach* meaning a rivulet; from whence comes the word *beck*, used for a brook in Yorkshire and Norfolk. However this may be, Dr. Sibthorp found *Becabunga* the Turkish name of this *Veronica*; adopted perhaps from some European doctor.

37. V. *Anagallis*. Water Speedwell, or Long-leaved Brooklime. Linn. Sp. Pl. 16. Willd. n. 31. Vahl n. 34. Fl. Brit. n. 9. Engl. Bot. t. 781. Curt. Lond. fasc. 5. t. 2. Pursh n. 6. Fl. Dan. t. 903. (Anagallis aquatica major; Ger. Em. 620.)—Clusters lateral, opposite. Leaves lanceolate, serrated. Stem erect.—Native of ditches, the borders of rivers, and other watery situations, throughout Europe; more general in North America than the foregoing; and found also in Japan. Perennial, and agreeing in habit with *V. Beccabunga*, but taller, more erect, and readily known by its long, acute, lanceolate *leaves*. The *clusters* also are longer and more pointed, and the *flowers* smaller, occasionally flesh-coloured.

38. V. *scutellata*. Narrow-leaved Marsh Speedwell. Linn. Sp. Pl. 16. Willd. n. 32. Vahl n. 35. Fl. Brit. n. 10. Engl. Bot. t. 782. Curt. Lond. fasc. 5. t. 3. Pursh n. 7. Fl. Dan. t. 209. Poit. et Turp. Paris. 15. t. 13. (V. palustris angustifolia; Rivin. Monop. Irr. t. 96. f. 1. Anagallis aquatica quarta; Lob. Ic. 467. Ger. Em. 621.)—Clusters lateral, alternate; partial flower-stalks divaricated. Leaves linear, slightly indented.—Native of watery places, especially on spongy bogs, or a sandy soil, in various parts of Europe and North America; much less common in England than the two last; flowering in July and August. A slender, weak, often purplish, perennial *herb*, with long narrow *leaves*, occasionally downy. *Flowers* pale flesh-coloured, with purple veins; their *stalks* bent quite back as the *capsule* ripens. The *clusters* are axillary, rarely opposite. *V. parmularia*, Poit. et Turp. Paris. 16. t. 14, is only the hairy variety of this species, mentioned in Fl. Brit., which is rather of a smaller size, and hairy or downy in every part of the herbage; but even the authors cited esteem it only a variety.

39. V. *gracilis*. Slender New-Holland Speedwell. Br. n. 4.—" Corymbs lateral, of few flowers. Leaves linear-lanceolate, nearly entire, very smooth as well as the nearly simple stem."—Native of Port Jackson, New South Wales. Partition of the *capsule* contrary to the valves. *Brown*.

40. V. *perfoliata*. Perfoliate Speedwell. Br. n. 3. Curt. Mag. t. 1936.—Clusters lateral, stalked, many-flowered. Leaves entire, very smooth, ovate, pointed; combined at the

the baſe. Capſule of four valves.—Native of Port Jackſon, New South Wales. *Flowers* dark blue.

41. V. *Billardieri*. Sharp-leaved Syrian Speedwell. Vahl n. 36.—Cluſters axillary, many times longer than the lanceolate-oblong, entire, hoary leaves. Stems proſtrate, hoary.—Gathered in Syria by M. Labillardiere. The *ſtems* are ſeveral, thread-ſhaped, ſomewhat branched, hoary and villous, like the foliage and flower-ſtalks. *Leaves* nearly ſeſſile, hardly the length of the nail, ſharpiſh, without ribs or veins, and accompanied by axillary rudiments of linear leaves. *Cluſters* after flowering two or three inches long. *Bracteas* linear, the length of the partial ſtalks. *Calyx* in four linear, equal ſegments, the length of the ſame. *Capſule* inverſely heart-ſhaped, compreſſed, as long as the calyx, becoming ſmoother as it ripens. *Vahl.*

42. V. *macroſtachya*. Blunt-leaved Syrian Speedwell. Vahl n. 37.—Cluſters axillary, many times longer than the linear-oblong, obtuſe, deeply ſerrated, hoary leaves. Stems proſtrate, hoary.—Native of Syria. *Labillardiere.* Every part of the herb is villous and hoary. *Stems* ſeveral, a ſpan long, thread-ſhaped, ſomewhat branched. *Leaves* ſeſſile, the length of the nail; a little dilated, and deeply ſerrated, towards the extremity. *Cluſters* long. *Bracteas* linear. *Calyx* in four linear ſegments. *Capſule* as in the laſt. In a garden the *ſtem* becomes eighteen inches, and each *cluſter* two feet, in length; with very ſoft downy *leaves*. *Vahl.*

43. V. *pectinata*. Pectinated Speedwell. Linn. Mant. 24. Willd. n. 36. Vahl n. 38. Sm. Prodr. Fl. Græc. Sibth. n. 25. (V. conſtantinopolitana incana, chamædryos folio; Tourn. Cor. 7. Buxb. Cent. 1. 25. t. 39. f. 1.)—Cluſters lateral, on leafy ſtalks. Leaves oblong, with deep parallel ſerratures. Stems proſtrate.—Gathered by Buxbaum, and ſince by Sibthorp, on craggy ſhelvy mountains, bordering both ſhores of the Boſphorus, flowering in ſpring. Mr. Hawkins met with this plant on the higheſt ſummits of the Sphaciote mountains of Crete. It has a woody perennial *root*, and ſeveral woody *ſtems*, a finger's length, chiefly hairy on two oppoſite ſides. *Leaves* nearly ſeſſile, not an inch long, with parallel, bluntiſh, rather deep inciſions. *Flowers* blue, in long, looſe, downy *cluſters*, whoſe *ſtalks* bear ſeveral, alternate, partly entire, leaves. Segments of the *calyx* linear, obtuſe, hairy, two of them much longer than the other two.

44. V. *orientalis*. Various-leaved Speedwell. Mill. Dict. ed. 8. n. 10. Ait. n. 27. Willd. n. 39. Vahl n. 39. Marſch. Taur.-Cauc. v. 1. 12. (V. auſtriaca β; Linn. Sp. Pl. 17; the ſpecimen marked V. cappadocica, foliis laciniatis; Tourn. Cor. though no ſuch name occurs there. V. heterophylla; Saliſb. Ic. 7. t. 4. V. montana, folio vario; Buxb. Cent. 1. 24. t. 38.)—Cluſters lateral, lax, on partly leafy ſtalks. Leaves pinnatifid, ſmooth, acute; tapering at the baſe; the uppermoſt linear-lanceolate, nearly entire. Partial ſtalks capillary, longer than the bracteas.—Native of graſſy paſtures in Armenia, Georgia, and Tauria, flowering in June and July. Miller cultivated it in 1748, and it is ſtill preſerved in the gardens; but there was no reaſon for retaining his unmeaning name, which had not come into general uſe, inſtead of the expreſſive one of *heterophylla*. This evil it is now too late to remedy. The plant is hardy and perennial, buſhy, of a pale and ſmooth appearance, the *leaves* variouſly cut, thin, flat, and pliant. *Flowers* copious, rather large, light blue, prettily ſtriated. *Calyx* and *bracteas* linear, rather downy. *Capſule* kidney-ſhaped.

45. V. *taurica*. Narrow-leaved Taurian Speedwell. Willd. n. 42. (V. orientalis β; Vahl n. 39. Marſch. Taur.-Cauc. v. 1. 12.)—Cluſters lateral, lax, on naked ſtalks. Leaves linear, revolute, downy, tapering at the baſe; entire, or ſomewhat toothed. Partial ſtalks longer than the obtuſe bracteas.—Native of Tauria, on chalky ſtony hills, flowering from June to Auguſt. We cannot agree with Vahl in reducing this to *V. orientalis*. Our wild ſpecimens, from the Chevalier de Steven, ſhew it to be a more firm and rigid plant, with woody *roots*. The decumbent *ſtems* are not a finger's length. *Leaves* almoſt coriaceous, bright green, an inch long, ſomewhat downy on both ſides, very narrow and revolute in their lower part; ſome of them cut into two, rarely more, ſtrong, lateral, tooth-like ſegments. *Cluſters* axillary, greatly overtopping the branches, as in the foregoing; but the lower part of their long firm ſtalks is naked, never leafy. The *bracteas*, and ſegments of the *calyx*, are obovate and obtuſe, not linear. *Flowers* but half the ſize of the laſt; according to Willdenow roſe-coloured, as they ſeem in our ſpecimen. *Capſule* abrupt, ſcarcely lobed.

46. V. *parviflora*. Small-flowered Oriental Speedwell. Vahl n. 40. (V. orientalis minima, foliis laciniatis; Tourn. Cor. 7. Buxb. Cent. 1. 26. t. 41. f. 2.)—Cluſters ſeveral, lateral, on naked ſtalks. Leaves pinnatifid, linear, revolute. Bracteas linear, obtuſe, as long as the partial ſtalks.—Native of Cappadocia and Armenia, in graſſy hilly paſtures, flowering in June. Linnæus confounded it with *V. pectinata*, though nothing can be more diſtinct; nor can there be leſs difficulty in diſtinguiſhing this ſpecies from the two laſt. The *ſtems* are hardly a finger's length. *Leaves* deeply and regularly pinnatifid, thick, obtuſe, revolute, and in our ſpecimen rather downy, as in *taurica*; Vahl ſays ſmooth. *Cluſters* from four to ſix about the top of the ſtem, and riſing far above it, downy all over, on long, round, downy, leafleſs ſtalks. *Partial ſtalks* rather ſhorter than the *bracteas*. *Flowers* blue, much ſmaller than even the laſt. *Calyx* with four linear, obtuſe, very unequal ſegments. *Capſule* inverſely heart-ſhaped, more deeply divided than in *taurica*.

47. V. *roſea*. Roſe-coloured Speedwell. Desfont. Atlant. v. 1. 13. Vahl n. 41.—Cluſters denſe, axillary, nearly terminal, on naked ſtalks. Leaves unequally pinnatifid, minutely hairy; lower ones wedge-ſhaped, obtuſe, toothed. Bracteas linear, nearly as long as the partial ſtalks.—Found by Desfontaines, on mount Atlas, near Tlemſen. The *ſtems* are ſhrubby, numerous, aſcending, from four to eight inches high. *Leaves* an inch long, acute, tapering at the baſe into a ſhort *footſtalk*. *Calyx* in four linear-lanceolate unequal ſegments. *Corolla* roſe-coloured, the ſize of *V. Teucrium*, hereafter deſcribed.

48. V. *auſtriaca*. Auſtrian Speedwell. Linn. Sp. Pl. 17. Willd. n. 41. Vahl n. 42. Ait. n. 28. (V. multifida et auſtriaca; Jacq. Auſtr. v. 4. 15. t. 329. Chamædrys ſpuria, tenuiſſimè laciniata; Bauh. Hiſt. v. 3. 287. Moriſ. ſect. 3. t. 23. f. 17.)—Cluſters lateral, on long naked ſtalks. Leaves ſlightly hairy, variouſly pinnatifid, or bipinnatifid; moſt deeply towards the baſe. Partial ſtalks capillary. Calyx very unequally five-cleft, ſomewhat hairy.—Native of Auſtria, Sileſia and Carniola, a hardy perennial in our gardens, flowering from June to Auguſt. The herbage is more or leſs downy, but ſcarcely hoary, except the *ſtems*, which are round, leafy, a ſpan or more in height. *Leaves* various in their diviſions, the ſegments generally broader upwards, all decurrent, ſometimes as narrow and compound as in *V. multifida*, with which moſt botaniſts have always confounded the preſent ſpecies. *Flowers* light blue, in ſeveral long, lax, axillary *cluſters*, riſing high above the ſtem. Segments of the *calyx* acute, the two lowermoſt very long, the fifth oppoſite to them, between the two others, much ſmaller than

than either, but, as far as we can discern, always present. Divisions of the *corolla* elliptic-oblong, acute. *Capsule* small, shorter than the calyx, elliptic-obcordate.

49. V. *multifida*. Fine-cut Speedwell. Linn. Sp. Pl. 17, excluding the synonym. Willd. n. 40. Vahl n. 43. Sm. Tr. of Linn. Soc. v. 1. 191. Marsch Taur.-Caucas. v. 1. 12. Curt. Mag. t. 1679. (V. n. 38; Gmel. Sib. v. 3. 222; excluding the synonym of Tournefort.)—Clusters lateral, on long naked stalks. Leaves deeply and doubly pinnatifid, downy, with linear revolute segments tapering downwards. Calyx very unequally five-cleft. Segments of the corolla rounded.—Native of open fields and hills, in Siberia, Tauria, and about mount Caucasus, flowering in April and May. A much smaller plant, more delicate in its herbage, than the last, as well as more downy. The narrow revolute spreading segments of the *leaves*, resembling some kinds of *Artemisia*, readily distinguish it. The *flowers* are bright blue, with rounder broader divisions than in *V. austriaca*. The *calyx* is very smooth in every flower of the original Linnæan specimen, but in most others, from various quarters, it is more or less downy. The fifth segment is minute, scarcely half so long as the shortest of the others. Baron Marschall a Bieberstein observes, that all this tribe of *Veronicæ*, with cut leaves, have a five-cleft *calyx*.

50. V. *tenuifolia*. Slender-leaved Georgian Speedwell. Marsch. Taur.-Caucas. v. 1. 13.—"Clusters lateral. Leaves pinnatifid, with linear-threadshaped divisions. Segments of the calyx awl-shaped; three upper ones very short. Stems ascending."—Gathered in Georgia, by the Chevalier de Steven. Perennial. Akin to the last, but the *stems* are more elongated; *leaves* less subdivided; their segments, especially those of the lower ones, longer; *partial stalks* equal to the *bracteas*, or longer; three upper segments of the *calyx* minute. May this be *V. parviflora* of Vahl? (see n. 46.) The *flowers* however are by no means smaller than *multifida* or *orientalis*. *Marschall.*

51. V. *caucasica*. Slender-leaved Caucasian Speedwell. Marsch. Taur.-Caucas. v. 1. 13.—"Clusters lateral. Leaves doubly pinnatifid, with lanceolate or linear segments. Partial stalks capillary. Segments of the calyx lanceolate, nearly equal. Stem almost erect."—From the same country. Perennial. The *leaves* are like *multifida*, but the divisions of the lower ones are broader. *Partial stalks* longer than the *bracteas*. Segments of the *calyx* four, almost equal, broader than in the neighbouring species. Lobes of the *corolla* rounded. *Marschall.*

52. V. *Allionii*. Shining-leaved Speedwell. Villars Dauph. v. 2. 8. Sm. Tr. of Linn. Soc. v. 1. 190. Willd. n. 18. Vahl n. 44. Ait. n. 19. (V. pyrenaica; Allion. Pedem. v. 1. 73. t. 46. f. 3. V. repens, ex alis spicata, &c.; Spec. 21. t. 4. V. officinalis β; Linn. Sp. Pl. 14. V. n. 2; Ger. Galloprov. 332. V. mas repens pyrenaica, folio longiori glabro; Sherard Schol. Bot. 46. Tourn. Inst. 143. Pluk. Phyt. t. 233. f. 1.)—Clusters lateral, very dense, obtuse, on long smooth stalks. Leaves roundish-oblong, crenate, rigid, shining, smooth as well as the creeping stems.—Native of mount Cenis, and the alps of Switzerland, Dauphiny and Savoy, flowering in August. *Root* perennial, creeping. *Stems* round, procumbent, leafy, creeping also to a great extent. *Leaves* roundish, or obovate, firm and coriaceous; paler beneath: on short broad *footstalks*. *Clusters* axillary, solitary, scarcely more than one to each branch, on a round, naked, firm, ascending stalk, thrice the length of the leaves; the *cluster* itself an inch long, downy, elliptic-oblong, obtuse, of numerous, crowded, violet-blue *flowers*, with very short *partial stalks*, not half the length of the obtuse *bracteas*. *Calyx* in four oblong, unequal segments. Villars mentions a hairy variety. This species, confounded by Linnæus with the following, is of a much more rigid, compact, and smooth habit, of a darker hue, and unquestionably very distinct. Its infusion, used medicinally in the south of France, for colds, coughs, debility of the stomach, &c. is said to be more fragrant and aromatic than that of *V. officinalis*, a popular medicinal tea in the northern parts of Europe.

53. V. *officinalis*. Common Male Speedwell. Linn. Sp. Pl. 14. Willd. n. 17. Vahl n. 45. Fl. Brit. n. 3. Engl. Bot. t. 765. Curt. Lond. fasc. 3. t. 1. Pursh n. 2. Woodv. Suppl. t. 219. Rivin. Monop. Irr. t. 93. Fl. Dan. t. 248. Poit. et Turp. Paris. 12. t. 8. (V. mas; Fuchs. Hist. 166. V. vera et major; Ger. Em. 626.)—Clusters lateral, stalked, slender, acute, rather lax. Leaves elliptic-oblong, serrated, rough, stem procumbent.—Native of dry sandy banks, heaths and woods, on a barren soil, throughout Europe and North America, flowering in May and June. Perennial. *Stems* trailing, branched, forming broad tufts or scattered patches. Whole plant hairy. *Leaves* more oblong, acute, pliant, paler, and more deeply serrated, than in the former. *Flowers* pale blue, or light pink, striated, in long, rather lax, alternate, axillary *clusters*, on hairy stalks, about twice the length of the leaves. *Capsule* inversely heart-shaped, splitting into four valves.

The late Mr. Mackay has sent us from the mountains above Blair in Athol, and from Ireland, a sort of intermediate variety between this and *V. Allionii*, partaking of the rigidity and smoothness of the latter, but even more strongly serrated than *officinalis*. We scarcely hesitate to which species to refer it, though we have never compared living specimens.

54. V. *reniformis*. Kidney-leaved Speedwell. Pursh n. 3.—Spikes lateral, stalked. Leaves kidney-heartshaped, deeply crenate, smooth. Stem creeping.—Collected by Messrs. Lewis and Clark, in boggy soil, on the banks of the Missouri, flowering in June. Perennial. *Stem* creeping, thread-shaped, taking root at the joints. *Leaves* opposite, on long stalks, deeply cut and notched. *Flower-stalks* axillary, alternate, round, smooth, the length of the leaves, bearing towards the top a single, oblong, crenate *bractea*. *Spike* oblong, short. *Flowers* large, crowded, pale blue. *Calyx* four-cleft; the two upper segments oblong; two lower linear, much smaller. *Corolla* flat, with oblong acute segments, thrice the length of the calyx; the lower one linear. *Filaments* the length of the corolla. *Pursh.*

55. V. *prostrata*. Trailing Germander Speedwell. Linn. Sp. Pl. 17. Willd. n. 35. Vahl n. 46. Ait. n. 24. Ehrh. Herb. n. 71. Roth in Sims and Kon. Ann. of Bot. v. 1. 137. (V. angustifolia minor; Rivin. Monop. Irr. t. 95. f. 2. Chamædrys spuria minor angustifolia; Bauh. Hist. v. 3. 287.)

β. V. satureiæfolia; Poit. et Turp. Paris. 18. t. 17.

Clusters lateral, mostly opposite, corymbose. Leaves elliptic-oblong, variously serrated, nearly sessile; upper ones narrower and entire. Stem ascending, partially naked at each side. Calyx five-cleft, very unequal.—Native of Germany, Switzerland, Italy, France, and the Levant. A hardy perennial, flowering in May and June. The *herbage* is light green, more or less downy, slightly hoary. *Stems* not a span long, clothed with short dense recurved pubescence, which is partly smoothed away, here and there, in opposite lateral lines. Leaves three-quarters of an inch long, rarely more, rather blunt, crenate or deeply serrated for the most part; the upper ones only being linear, revolute and entire; but in the variety, as we judge it, most of

the leaves are of the latter description. The *flowers* are bright blue, rather showy, in corymbose dense tufts, subsequently lengthened out into long lax *clusters*. The *calyx* seems to vary in acuteness, but is generally smooth.

56. V. *pilosa*. Hairy-stalked Germander Speedwell. Linn. Sp. Pl. 1663, excluding the description. Willd. n. 34. Vahl n. 47. (Chamædryos falsa species, Teucrium secundum aut quintum Clusii; Bauh. Hist. v. 3. 286.)—"Clusters somewhat spiked. Leaves ovate, obtuse, plaited. Stem prostrate, hairy."—Native of Austria. *Linnæus*. This is a very doubtful species, not to be found in the Linnæan herbarium; and the description in Sp. Pl. 1664. is erased by Linnæus himself, from his own copy.

Willdenow's description of a Bohemian specimen, in his possession, answers very nearly to one of those pasted together as the *prostrata*, in the Linnæan herbarium, whose *leaves* are more cut, and *calyx* rather sharper than the three others; but we cannot think there is any specific distinction between them. The *calyx* of this specimen has five segments, though that character is not invariable. Willdenow describes four.

57. V. *Teucrium*. Upright Germander Speedwell. Linn. Sp. Pl. 16, synonyms confused. Willd. n. 33. Vahl n. 48. Ehrh. Pl. Off. 51. Poit. et Turp. Parif. 16. t. 15. (V. montana; Rivin. Monop. Irr. t. 95. f. 1. Chamædrys spuria major angustifolia; Bauh. Pin. 249. Bauh. Hist. v. 3. 285. chap. 58. Ch. sylvestris; Dod. Pempt. 45. Ch. vulgaris mas; Fuchs. Hist. 871. Teucrii quarti tertia species; Clus. Hist. v. 1. 349.)—Clusters lateral, opposite, cylindrical, on long stalks. Leaves sessile, oblong-lanceolate, bluntly serrated, rough. Stem ascending, hairy. Fifth segment of the calyx very minute.—Native of Germany, Bohemia, and France, on a dry soil, flowering in May. The *root* is perennial. *Stems* seldom quite erect, a foot long, round, hairy, partly smooth on two opposite sides, leafy. *Leaves* an inch and a quarter long, veiny, hairy, strongly serrated, but not cut; a little dilated at the base. *Clusters* axillary, usually two near the top of the stem, rising high above it, on long, parallel, naked, downy stalks. *Flowers* copious, rather crowded, large, handsome, of a fine blue. Segments of the *calyx* oblong, the fifth minute, various, often obsolete.

Mr. Sieber has sent as a variety of this species the *V. dentata* of Schmidt, whose *leaves* are narrow, linear, and nearly all entire. Yet it is probably not specifically distinct.

58. V. *latifolia*. Great Germander Speedwell. Linn. Sp. Pl. 18. Willd. n. 44. Vahl n. 49. Ait. n. 30. Marsch. Taur.-Caucas. v. 1. 10. (V. Teucrium; Roth in Sims and Kon. Ann. of Bot. v. 1. 137. V. pseudo-chamædrys; Jacq. Austr. t. 60. Chamædrys spuria major altera, five frutescens; Bauh. Pin. 248. Teucrium majus pannonicum; Ger. Em. 659. T. quartum; Clus. Hist. v. 1. 349.)—Clusters lateral, opposite, tapering, on long stalks. Leaves sessile, ovate, somewhat heart-shaped, rough, deeply serrated and cut. Stem erect, hairy. Calyx unequally five-cleft. Native of Austria, Bohemia, Germany, and the Levant; a common hardy perennial in gardens, flowering in June and July. We have long supposed this not specifically distinct from the last. Vahl and Roth confound them; Willdenow seems to have been acquainted with their differences, and the old authors were clearly so. The present is a more robust plant, with broader more jagged *leaves*. The *stem* is quite smooth on two opposite sides, densely and equally hairy on the intermediate ones. *Flowers* large, copious, very brilliant, in dense more tapering clusters. Fifth segment of the *calyx* half as long as the two next, but on this mark we have little reliance. Linnæus has led Jacquin and others astray, by citing synonyms of *V. urticæfolia* for his *latifolia*, of which latter, as above described, the original specimen is preserved in his herbarium, nor can we concur with the learned Dr. Roth in transferring this name to the *urticifolia*: see his excellent remarks in Ann. of Bot. above cited. Neither do we by any means assert our *Teucrium* and *latifolium* to be more than varieties of each other, Schmidt's *dentata* perhaps excepted, which is too unlike the latter. We have only aimed at collecting their synonyms, and indicating what distinctions we could find, for future inquiry.

59. V. *peduncularis*. Long-stalked Germander Speedwell. Marsch. Taur.-Caucas. v. 1. 11. Sims and Kon. Ann. of Bot. v. 2. 401. (V. pedunculata; Vahl n. 50. V. chamædryos foliis parvis; Buxb. Cent. 1. 26. t. 41. f. 1.)—Clusters lateral, opposite; with long capillary partial stalks. Leaves stalked, ovate, deeply serrated and cut; their segments toothed. Calyx in four, nearly equal, bluntish segments.—Native of shady thickets and groves of mount Caucasus, flowering in May. Perennial. Akin to *V. Chamædrys* hereafter described, but the *stems* are hairy almost all round; *leaves* stalked, smaller, and yet more cut, in an unequal or compound manner. The partial *flower-stalks* are also longer; the *bracteas* and segments of the *calyx* broader and more obtuse. The variety γ of *Fl. Taur.-Caucas.* sent by the Chevalier de Steven, is of a very different and diminutive aspect; the *leaves* scarcely stalked, or cut.

60. V. *umbrosa*. Wood Germander Speedwell. Marsch. Taur.-Caucas. v. 1. 11.—"Clusters lateral, of few flowers. Leaves oblong, obtuse, distantly serrated, rough; uppermost linear-lanceolate, entire. Stems creeping. Calyx as long as the corolla."—Native of the dense shady forests of Tauria, about the town of Karassubasar, flowering in April and May. Perennial, forming loose tufts. Partial *flower-stalks* thread-shaped. Segments of the *calyx* linear.

Specimens sent by the Chevalier de Steven from Tauria, under this name, have smooth *leaves*, except the edges; *clusters* of rather numerous, though distant, large and handsome blue *flowers*; *bracteas* ovate, as well as the segments of the *calyx*, which last is but half the length of the *corolla*.

61. V. *Michauxii*. Michauxian Speedwell. Lamarck Illustr. v. 1. 44. Dict. v. 8. 532. Vahl n. 51.—"Clusters lateral. Flowers somewhat crowded. Leaves ovate, toothed, sessile. Herbage hairy and glutinous."—Brought from the East by Michaux to the Paris garden. *Stems* four to six inches long, clothed with whitish viscid hairs. *Leaves* opposite, obscurely toothed, bluntish, an inch and a half long, six lines broad, without ribs. *Stalks* axillary, opposite, some of them at the ends of the short lateral leafy branches all downy, hardly so long as the leaves. *Flowers* on very short downy stalks, crowded. *Bracteas* lanceolate. Segments of the *calyx* four, oval, sharpish, scarcely downy.

62. V. *Chamædrys*. Wild Germander Speedwell. Linn. Sp. Pl. 17. Willd. n. 38. Vahl n. 52. Fl. Brit. n. 12. Engl. Bot. t. 623. Curt. Lond. fasc. 1. t. 2. Mart. Rust. t. 66. Poit. et Turp. Parif. 13. t. 9. Fl. Dan. t. 448. (V. pratensis latifolia; Riv. Monop. Irr. t. 94. Chamædrys; Brunf. Herb. v. 1. 125. Ch. vulgaris fœmina; Fuchs. Hist. 872. Ch. sylvestris; Ger. Em. 657.)—Clusters lateral. Leaves ovate, sessile, rugged, deeply serrated. Stem diffuse, with a narrow hairy line at each side. Calyx four-cleft, lanceolate.—Native of grassy pastures, groves, and banks throughout Europe, and even in Japan, perennial, flowering in May. Few of our wild flowers can vie with this in elegance and brilliancy, nor can the pencil easily do

do it juſtice. The wavy *ſtems* ſpread in every direction, and are merely fringed at each ſide with a line of longiſh hairs, not only partially naked, as in *V. Teucrium* and *latifolia*. The *foliage* is akin to the latter, but leſs cut. *Cluſters* numerous, generally oppoſite, on hairy ſtalks, taper-pointed, many-flowered. *Bracteas* lanceolate, uſually rather ſhorter than the partial ſtalks. *Flowers* large, bright blue, moſt elegantly veined; paler at the back. *Capſule* inverſely heart-ſhaped, ſmall.

63. V. *urticæfolia*. Nettle-leaved Speedwell. Linn. Suppl. 83. Willd. n. 43. Vahl n. 53. Ait. n. 29. Jacq. Auſtr. t. 59. (V. n. 535; Hall. Hiſt. v. 1. 232. V. pratenſis, omnium maxima; Buxb. Cent. 1. 23. t. 34. V. maxima; Dalech. Hiſt. 1165. Chamædrys ſpuria major latifolia; Bauh. Pin. 248.)—Cluſters lateral, lax, with capillary ſtalks. Leaves ſeſſile, heart-ſhaped, pointed, ſharply ſerrated. Stem quite erect. Calyx four-cleft, ovate.—Native of woods in Auſtria, Bavaria, Switzerland, and Bithynia, flowering in May and June. This ſpecies was not known to Linnæus, till Jacquin, who originally took it for *latifolia*, ſent him a ſpecimen. Under this latter name it is deſcribed by Dr. Roth, in Sims and Kon. Ann. of Bot. v. 1. 137, but was never what Linnæus intended. No ſpecies is better defined nor better named. The large nettle-like *leaves* at once determine it. The *roots* are perennial, moderately creeping. *Stems* erect and ſtraight, ſlender, eighteen inches or two feet high, quite ſimple, marked with a ſlight hairy line. *Cluſters* numerous, axillary, oppoſite, erect, looſe and ſlender. *Flowers* ſmall, fleſh-coloured, with crimſon lines. *Capſule* of two ſemi-orbicular lobes.

64. V. *Ponæ*. Rock Germander Speedwell. Gouan Illuſtr. 1. t. 1. f. 1. Willd. n. 23, excluding the variety. Vahl n. 54. (V. petrea; Pon. Bald. 179? Cluſ. Hiſt. v. 2. 336?)—Cluſter nearly terminal, lax, of few flowers. Leaves ſeſſile, heart-ſhaped, obtuſe, coarſely ſerrated. Stem erect. Calyx five-cleft, ſmooth.—Native of the Pyrenees, and perhaps of mount Baldus. Perennial. *Stem* four or five inches high, quite ſimple and upright. Lower *leaves* ſmalleſt, roundiſh, crenate; the reſt an inch long, very blunt, coarſely ſerrated, entire at the extremity, beſprinkled with diſtant cloſe-preſſed hairs. *Bracteas* linear, the length of the partial ſtalks. *Flowers* diſtant, the ſize of *V. Chamædrys*. Such is Vahl's deſcription of Gouan's plant, which he received from that author, and found himſelf alſo on the Pyrenees. He aſſerts it to be a diſtinct ſpecies, nor do we doubt his accuracy. We nevertheleſs have great doubts reſpecting Pona's plant, which may be a Linnæan *Pæderota*, as Linnæus ſuppoſed; for the figure very cloſely agrees with Micheli's *Buonarota*, t. 15. Gouan himſelf ſeems not quite certain of Seguier's plant, from mount Baldus; nor do we implicitly confide in Gouan's learning with regard to ſynonyms. The references to Plukenet, *Phyt*. t. 233. f. 2. and 3, are beſt omitted. Willdenow is ſurely wrong in referring hither Allioni's *V. pumila*, which Vahl more judiciouſly conſiders as *V. alpina*; ſee our n. 22.

65. V. *montana*. Mountain Germander Speedwell. Linn. Sp. Pl. 17. Suppl. 83. Willd. n. 37. Vahl n. 55. Fl. Brit. n. 11. Engl. Bot. t. 766. Curt. Lond. faſc. 4. t. 2. Jacq. Auſtr. t. 109. Hoffm. Germ. ann. 1791. t. 1. Fl. Dan. t. 1201. (V. procumbens; Rivin. Monop. Irr. t. 93. Alyſſum Dioſcoridis montanum; Column. Ecphr. v. 1. 286. t. 288.)—Cluſters lateral, elongated, lax, of few flowers. Leaves ovate, ſtalked, ſerrated. Stem diffuſe, hairy all round. Native of ſhady rather mountainous woods, eſpecially on a calcareous ſoil, in Denmark, England, Germany, and Italy, flowering in May and June. A very diſtinct perennial ſpecies, which ſome botaniſts have incautiouſly confounded with *V. Chamædrys*. Scopoli, ſtill more unaccountably, united them both with *V. Teucrium*. Sherard, who firſt noticed the *montana* in England, and Curtis, have been more exact in their obſervations. The *ſtem* being hairy in every direction, and the large *capſule* formed of two orbicular lobes, not obcordate, are abundantly ſufficient diſtinctions. The *leaves* are thinner, and more ſhining, than in *Chamædrys*; *flowers* ſmaller, paler, much leſs beautiful; ſegments of the *calyx* obovate. We regret that a miſtake of the late very accurate Mr. W. Brunton is recorded in Turner's and Dillwyn's Botaniſt's Guide 666. He ſeems to have taken up a portion of the root of *Chamædrys* along with *montana*, and thought the latter was, in the following ſeaſon, transformed into the former. His ſpecimens are before us; and of the obvious and abſolute diſtinctneſs of the ſpecies there can be no doubt, however they came together.

66. V. *calycina*. Long-cupped New Holland Speedwell. Br. n. 5.—Cluſters lateral, of few flowers. Leaves ſtalked, ovate, rugoſe, unequally crenate, hairy as well as the creeping ſtem. Calyx hairy, fringed, longer than the capſule. Obſerved by Mr. Brown, in Van Diemen's iſland, and on the ſouth coaſt of New Holland.

67. V. *diſtans*. Diſtant-flowered New Holland Speedwell. Br. n. 6.—Corymbs lateral, ſtalked, of few flowers. Leaves ovate, broadly ſerrated, ſmooth. Footſtalks fringed. Stem decumbent, with a hairy line at each ſide.—Gathered on the ſouth coaſt of New Holland, by Mr. Brown.

68. V. *arguta*. Sharp-toothed New Holland Speedwell. Br. n. 7.—Cluſters lateral, lax. Leaves ovato-lanceolate, ſmooth, unequally ſerrated. Stem downy on two oppoſite ſides. Lower footſtalks one-third the length of the leaves.—Gathered by Mr. Brown at Port Jackſon, New South Wales. A ſpecimen from the ſame country, communicated by Mr. Lambert, anſwers in every reſpect to the above definition, except that the *leaves* are triangular-heartſhaped; but perhaps it may be a variety only. The *calyx* has four obovate ſegments, rather longer than the nearly orbicular *capſule*.

69. V. *plebeia*. Common New Holland Speedwell. Br. n. 8.—Cluſters lateral, lax. Leaves ovate, unequally and deeply ſerrated, ſmooth. Stem very finely downy. Lower footſtalks half as long again as the leaves.—Gathered at Port Jackſon, by Mr. Brown, who ſpeaks of it as very cloſely related to the laſt.

Sect. 4. *Stalks ſingle-flowered, axillary.*

70. V. *biloba*. Two-lobed Speedwell. Linn. Mant. 172, excluding the ſynonyms of Columna and Bauhin. Sm. Tr. of Linn. Soc. v. 1. 193. Willd. n. 46. Vahl n. 56. (V. orientalis, ocymi folio, flore minimo; Tourn. Cor. 7. V. arvenſis annua, chamædryos folio; Buxb. Cent. 1. 24. t. 36.)—Flower-ſtalks thread-ſhaped. Leaves ovate, acute, ſerrated, nearly ſmooth. Calyx of the fruit in four deep, ovate, three-ribbed, almoſt equal, ſegments.—Gathered by Tournefort in corn-fields in Cappadocia; and by the Chevalier de Steven on the eaſtern mountains of Caucaſus. The *root* is annual. *Stems* two to four inches high, erect, branched, downy. *Leaves* ſomewhat heart-ſhaped at the baſe, half or three-quarters of an inch long, on ſhort ſtalks. *Flowers* axillary, ſolitary, alternate, about the top of the ſtem and branches, the leaves which accompany them being more entire, and ſeſſile, than the reſt. Segments of the *calyx* lanceolate while in flower, the two uppermoſt ſhorteſt; afterwards they become much larger, ovate, fringed, marked with two evident lateral ribs beſides the central one. *Corolla* ſmall, white. *Capſule* hairy, of

two distinct, divaricated, rounded lobes, much shorter than the permanent calyx. Linnæus seems to have taken his specific character from Columna's Ecphrasis, t. 290, which represents a widely different species, akin to *Chamædrys*, possibly the *Pona* of Gouan; see n. 64.

71. V. *amoena*. Handsome-flowered Annual Speedwell. Marsch. Taur.-Caucas. v. 1. 14.—"Flowers solitary. Leaves ovate, crenate; floral ones oblong, entire, much shorter than the flower-stalks. Segments of the calyx linear. Stem spreading."—Gathered by the Chevalier de Steven, in the fields of Georgia, flowering early in spring. *Root* annual. *Herb* the size of *V. arvensis*. The floral *leaves* are minute and entire, so different from the rest, as to cause a doubt whether they be other than *bracteas*, and the *inflorescence* racemose. This is the most beautiful species of the present section, on account of its very large blue *flowers*, white in the middle. *Marsch.*

72. V. *glauca*. Glaucous Three-cleft Speedwell. Sm. Fl. Græc. Sibth. v. 1. 6. t. 7.—Flowers solitary. Leaves heart-shaped, deeply serrated. Stems procumbent. Segments of the calyx three-cleft.—Native of the summit of mount Hymettus, above Athens. *Mr. Ferdinand Bauer*. *Root* annual. *Stems* spreading on the ground in every direction, much branched, reddish, with a dense hairy line at each side. *Leaves* glaucous, stalked, more or less deeply cut, scarcely an inch long, most hairy at the base and underneath; the lower ones opposite; upper alternate. *Flower-stalks* capillary, smooth, shorter than the leaves. *Calyx* in four very deep, nearly equal, wedge-shaped segments, remarkable for being three-cleft, which well marks the species. *Corolla* deep blue, white in the centre.

73. V. *agrestis*. Procumbent Field Speedwell. Linn. Sp. Pl. 18. Willd. n. 47. Vahl n. 58. Fl. Brit. n. 13. Engl. Bot. t. 783. Curt. Lond. fasc. 1. t. 1. Fl. Dan. t. 449. (V. folio chamædryos; Rivin. Monop. Irr. t. 99. f. 2. Alsine foliis trissaginis; Ger. Em. 616.)

β. Sm. Fl. Græc. Sibth. v. 1. 6. t. 8. (V. persica; Poir. in Lam. Dict. v. 8. 542. V. flosculis oblongis pediculis insidentibus, chamædryos folio, major; Buxb. Cent. 1. 26. t. 40. f. 2.)

Flowers solitary. Leaves ovate, deeply serrated, shorter than the flower-stalks. Stems procumbent. Segments of the calyx ovate. Seeds cupped.—Native of cultivated and waste ground, throughout Europe, annual, flowering from April to the end of autumn. β was gathered by Dr. Sibthorp, in Prince's islands, near Constantinople. *Root* small. *Stems* prostrate, simple, except at the base, round, leafy, hairy, from six to twelve inches long. Some of the lower *leaves* are opposite, but the greater part are alternate, all stalked, roughish. *Flowers* deep blue, rather small. Segments of the *calyx* ovato-lanceolate, fringed, generally quite entire, now and then irregularly toothed; becoming broadly ovate as the fruit advances. *Capsule* rough, of two round swelling lobes. *Seeds* about six in each cell, externally rugged, hollowed out underneath, where their stalk is inserted.—We would gladly, if possible, have made a distinct species of the *V. byzantina* of Sibthorp's manuscripts, our variety β; but no difference is to be found, except the greater size of every part. The *corolla* is much larger, paler, more elegantly streaked. The form of the *calyx*, tumid *capsule*, and curious structure of the *seeds*, are all the same as in our common kind.

74. V. *arvensis*. Wall Speedwell, or Speedwell Chickweed. Linn. Sp. Pl. 18. Willd. n. 48. Vahl n. 59. Fl. Brit. n. 14. Engl. Bot. t. 734. Curt. Lond. fasc. 2. t. 2. Fl. Dan. t. 515. Pursh n. 8. (Alsine foliis veronicæ; Ger. Em. 613. Alyssum; Column. Phytob. t. 28.)—Flowers solitary, nearly sessile. Leaves ovate, deeply serrated; the floral ones lanceolate, entire. Stem erect. Seeds flat.—Native of Europe, North America and Japan, on walls, banks, and dry gravelly or sandy ground, flowering in May. The *herbage* is of a pale green, rough. *Stem* about six inches high, branched from the bottom. Lowest *leaves* on short stalks; the rest sessile; the floral ones so small, as to seem like *bracteas* only, but their true nature appears from the analogy of other annual species. *Flowers* small, pale blue; their very short stalks more or less elongated as the fruit advances. Segments of the *calyx* lanceolate, somewhat unequal. *Capsule* inversely heart-shaped, compressed. *Seeds* elliptical, flat, with a little dimple in the centre of one side.

75. V. *rotundifolia*. Round-leaved Peruvian Speedwell. "Fl. Peruv. v. 1. 6." Vahl n. 60.—"Flowers solitary, stalked. Leaves orbicular-kidneyshaped, crenate. Stem thread-shaped, creeping."—Plentiful in boggy situations in Peru. Hairy. *Stem* slender, branched, round, purple. *Leaves* two or three, often but one, from each joint, on long stalks, somewhat peltate, deeply notched. *Flower-stalks* twice the length of the footstalks. Segments of the *calyx* lanceolate. *Corolla* of a rosy purple, with ovate segments. *Stamens* three, the length of the tube. The *flowers* are occasionally five-cleft, with four stamens. *Vahl* from the *Fl. Peruv.* There is no figure, and having seen no specimen, we are very ready to concur with Vahl, in his opinion, that the genus of this plant is doubtful.

76. V. *cymbalaria*. White Oriental Speedwell. Sm. Fl. Græc. Sibth. v. 1. 7. t. 9. (V. cymbalariæfolia; Vahl n. 61. V. cymbalarifolia; Gmel. Tubing. 6. V. hederifolia β; Linn. Sp. Pl. 19. Willd. n. 49. V. chia, cymbalariæ folio, verna, flore albo umbilico virescente; Tourn. Cor. 7. Buxb. Cent. 1. 25. t. 39. f. 2.)—Flowers solitary. Leaves heart-shaped, deeply crenate. Segments of the calyx rounded. Seeds cupped, nearly smooth.—Native of fields about Constantinople, and in the Greek islands, as well as in Morocco. Annual. *Stems* spreading or procumbent, branched at the base only, a span long, square, with a hairy line at two opposite sides. *Leaves* all stalked, opposite, rounded, obtuse, with two or three deep notches at each side, but scarcely lobed. *Flowers* white with a yellow centre, on long, opposite, capillary stalks, reaching beyond their corresponding leaves. Segments of the *calyx* obovate, obtuse, fringed, entire. *Capsule* turgid, of two round lobes, hairy. *Seeds* only two in each cell, large, hollow at one side, nearly smooth externally, chiefly wrinkled at the margin. Very distinct in its *calyx* from the following.

77. V. *hederifolia*. Ivy-leaved Speedwell. Linn. Sp. Pl. 19. Willd. n. 49. Vahl n. 62. Fl. Brit. n. 15. Engl. Bot. t. 784. Curt. Lond. fasc. 2. t. 1. Poit. et Turp. Paris. 23. t. 26. Fl. Dan. t. 428. (V. folio hederæ; Rivin. Monop. Irr. t. 99. Alsine hederacea; Ger. Em. 616. Alsines quartum genus; Fuchs. Ic. 13.)—Flowers solitary. Leaves heart-shaped, flat, five-lobed. Segments of the calyx heart-shaped, acute. Seeds cupped, wrinkled. —Native of fields and waste ground throughout Europe, flowering in April and May. Annual, in habit like the last, but the *leaves* are more decidedly lobed, and ivy-like, though of a pale green. They are also, except a very few of the lowermost, all alternate, mostly longer than their *footstalks*. *Flowers* pale blue, on long, solitary, axillary stalks. Segments of the *calyx* nearly equal, pointed, three-ribbed, with a very broad heart-shaped base. *Seeds* much more wrinkled at the outside than the last, but agreeing with that species and *agrestis* in their reversed cup-like form. —The late Mr. Crowe observed to the writer of this, after the

the present species had appeared in *Engl. Bot.*, that it is scarcely to be found with us in flower later than May, and that the Norfolk farmers call it Winter-weed.

78. V. *filiformis*. Capillary-stalked Speedwell. Sm. Tr. of Linn. Soc. v. 1. 195. Willd. n. 50. Vahl n. 63. Marsch. Taur.-Caucas. v. 1. 15. (V. orientalis, foliis hederæ terrestris, magno flore; Tourn. Cor. 7. Buxb. Cent. 1. 25. t. 40. f. 1.)—Flowers solitary. Leaves heart-shaped, crenate, much shorter than the long slender flower-stalks. Segments of the calyx lanceolate.—Native of the Levant; found by the Chevalier de Steven in mountainous fields of Georgia, flowering early in the spring. We have compared his specimens with Tournefort's, nor is there any difference, though the reference to this author is directed in the *Fl. Taur.-Caucas.* to be struck out. The *root* is annual. *Stems* long and trailing. *Leaves* a quarter of an inch long, alternate, on short stalks, and shaped more like those of *arvensis* or *agrestis* than of *hederifolia*. *Flower-stalks* four times as long as the leaves. Segments of the *calyx* elliptic-lanceolate, obtuse, slightly three-ribbed. *Capsule* inversely heart-shaped, reticulated with veins. *Seeds* somewhat cupped.

79. V. *Crista-galli*. Crested Speedwell. Stev. Tr. of Linn. Soc. v. 11. 408. t. 31.—Flower-stalks solitary, as long as the ovate, serrated, nearly sessile, leaves. Calyx of the fruit divided to the base into two heart-shaped, cloven, serrated, compressed leaves.—Found by the Chevalier de Steven, to whom we are obliged for a specimen, very plentifully in the dense shady forests of Eastern Caucasus, above Kubam, flowering in May. The *root* is annual. *Stem* a span high, ascending, simple, or alternately branched, slender, downy, on two opposite sides. *Leaves* most like *V. agrestis*, uniform; the floral ones alternate, the rest opposite. *Stalks* axillary, slender, downy. *Flowers* extremely minute and fugacious, blue. *Calyx* greatly enlarged after flowering, of two flat, parallel, strongly serrated, veined, heart-shaped valves, each with two points, being altogether peculiar in this genus, and about the diameter of the leaves. *Capsule* of two nearly orbicular lobes, shorter than the permanent calyx, very minutely fringed. *Seeds* solitary in each cell, black, rugged; concave, or umbilicated, at one side; inserted at the top of the cell.

80. V. *triphyllos*. Blunt-fingered Speedwell. Linn. Sp. Pl. 19. Willd. n. 51. Vahl n. 64. Fl. Brit. n. 16. Engl. Bot. t. 26. Sm. Fl. Græc. Sibth. v. 1. 8. t. 10. Curt. Lond. fasc. 6. t. 2. Fl. Dan. t. 627. (V. folio rutæ; Rivin. Monop. Irr. t. 96. Alsine recta; Ger. Em. 612.)—Flowers solitary. Upper leaves in deep, finger-like, obtuse segments. Flower-stalks longer than the calyx. Seeds flat.—Native of sandy fields, here and there, throughout Europe; rare in England, occurring chiefly in the sandy confines of Norfolk and Suffolk, flowering in April. Dr. Sibthorp found it, very luxuriant, in fields bordering on the Euxine sea. A small upright annual plant, more or less branched, leafy, downy, a little viscid and hoary. Lower *leaves* opposite, undivided, scarcely lobed; upper alternate, in three deep segments, the lateral ones often cloven. *Flowers* of a rich dark blue. Two segments of the *calyx* sometimes notched. *Capsule* almost orbicular, emarginate. *Seeds* numerous, obovate, flat. This plant turns black in drying, like most of the following species.

81. V. *verna*. Vernal Speedwell. Linn. Sp. Pl. 19. Willd. n. 52. Vahl n. 65. Fl. Brit. n. 17. Engl. Bot. t. 25. Rose Elem. app. 444. t. 2. f. 1. Fl. Dan. t. 252. Poit. et Turp. Paris. 21. t. 22. (V. Bellardi; Willd. n. 56. Allion. Pedem. v. 1. 77. t. 85. f. 1. V. succulenta; ibid. 78. t. 22. f. 4.)—Flowers solitary. Leaves pinnatifid. Flower-stalks shorter than the calyx. Stem erect.—Native of dry open sandy fields in various parts of Europe, flowering in April. In England it chiefly occurs about Bury, Thetford, and the same sandy country as the last, but there in the greatest abundance, though soon disappearing after the seed is shed. This diminutive species is most akin to *V. arvensis*, in the flat elliptical form of its *seeds*, general habit and colour; not turning black in drying, like *triphyllos* and most of its allies. But the *leaves*, unless starved, are deeply fingered, or pinnatifid, their terminal lobe often large and rounded, like *triphyllos*; even the floral ones are deeply three-cleft. The *stem*, whether branched or not, is stiff and erect, from one to four inches high. *Calyx* in four nearly equal, lanceolate, acute segments. *Capsule* inversely heart-shaped. The herb varies so much in luxuriance, and consequently in the divisions of its *leaves*, that scarcely two representations of it are alike.

82. V. *digitata*. Slender-fingered Speedwell. Vahl n. 66. Symb. v. 1. 2. (V. verna; Cavan. Leccion. 22. V. acinifolia; Ait. n. 37. V. chamæpithyoides; Lamarck Illustr. v. 1. 47.)—Flowers solitary, sessile. Leaves all in deep, finger-like, linear segments. Stem erect. Capsule wedge-shaped.—Native of the south of Europe. We have gathered it in Lombardy, and received it from near Aranjuez in Spain, by favour of the late abbé Cavanilles, who has described this species for *verna*. The plant is annual, flowering in April. *Stem* branched from the bottom only, from three to six or eight inches high, rigid, round, downy, leafy, rather woody. *Leaves* alternate, sessile, generally cut, more than half way down, into three, five, or seven, linear, obtuse, fleshy, somewhat rough or hairy, entire segments; the base narrow and linear, which Vahl considers, perhaps justly, as a *footstalk*. *Flowers* small, axillary. *Calyx* in four deep, lanceolate, fringed segments, the length of the capsule, two of them shorter than the rest. *Capsule* inversely heart-shaped, but with straight sides, rough, abrupt, rigid. *Seeds* pale, roundish, not compressed.

83. V. *præcox*. Early Jagged Speedwell. Allion. Auctuar. 5. t. 1. f. 1. Vahl n. 57. Poit. et Turp. Paris. 22. t. 24. (V. acinifolia; Willd. Prodr. Berol. 11. V. minor annua, ocymi caryophyllati folio, subtus rubro; Vaill. Paris. 202.)—Flowers solitary, stalked. Lower leaves opposite, stalked, heart-shaped, deeply serrated and notched; uppermost oblong, alternate, nearly entire. Stem erect. Style longer than the lobes of the capsule.—Native of fields about Turin, Paris, and Berlin, flowering in March and April. Mr. Davall found it also in the Lower Valais, in April, 1787. An annual upright plant, about the size of *V. arvensis*, but with more of the habit and red hue of *triphyllos*, much larger and stronger than *verna*. *Stem* chiefly branched from the bottom, round, downy all over, but most densely on two opposite sides. *Leaves* rough, rather fleshy; the largest half an inch long, and nearly as broad, obtuse; variously toothed or jagged; floral ones hardly so long as the *flower-stalks*. *Flowers* blue or purplish. Segments of the *calyx* obovate-oblong, hairy, two of them rather the shortest. *Capsule* inversely heart-shaped, hairy, tumid, rounded at the sides, so as to be somewhat orbicular, the permanent *style* extending far beyond its lobes. *Seeds* numerous, roundish, cupped and umbilicated.—No wonder that those botanists, who had not seen both species, have always taken this for the following, and yet they are essentially distinct.

84. V. *acinifolia*. Basil-leaved Early Speedwell. Linn. Sp. Pl. 19. Willd. n. 54. Vahl n. 67. Dicks. Dr. Pl. n. 1. Poit. et Turp. Paris. 22. t. 23. Allion. Ped. v. 1. 79. (V. romana; ibid. t. 85. f. 2. V. minima, clinopodii minoris folio; Vaill. Paris. 201. t. 33. f. 3. V. minima, clinopodii minoris folio glabro, romana; Bocc. Mus. 19. t. 102.) —Flowers

—Flowers solitary, stalked. Leaves opposite, ovate, slightly crenate; lower ones opposite, partly stalked; upper sessile, alternate, entire. Stem erect. Style about as long as the lobes of the capsule.—Native of France, Italy, Turkey, and, as it is reported, of Germany; though we have never received from that country any thing but *arvensis* or *præcox* under this name. In shady neglected garden walks, and gravelly ground, about Rome, nothing is more common than this little annual, flowering in April. What Mr. Davall sent to Kew for *acinifolia*, in 1788, was certainly the *præcox*. The present is by far the most delicate and slender plant of the two, though nearly of the same height. *Leaves* smoother, paler, ovate, and much more entire. *Flowers* much smaller, on rather longer, more capillary, stalks. Segments of the *calyx* ovate, or obovate. *Capsule* short, broadly obcordate, with round distant lobes, between which the permanent *style* is situated, scarcely, if at all, extending beyond them. *Seeds* numerous, oval, flat. The authors of the splendid, but too soon discontinued, *Flore Parisienne*, have well distinguished these two last species, by the proportion of the *styles* to their respective, very differently shaped, *capsules*. It is curious to observe how authors have erred and copied each other's errors, in their citation of Boccone. See Linnæus, Willdenow, Vahl, and Poiret in Lamarck.

85. V. *peregrina.* Purslane-leaved Speedwell. Linn. Sp. Pl. 20. Willd. n. 55. Vahl n. 68. Ait. n. 38. Sm. Tr. of Linn. Soc. v. 1. 192. Pursh n. 9. Fl. Dan. t. 407. (V. romana; Linn. Sp. Pl. 19. Mant. 317. V. marilandica; Linn. Sp. Pl. 20. "Murr. in Comm. Goett. for 1782. 11. t. 3." V. caroliniana; Walt. Carolin. 61. V. terrestris annua, folio polygoni, flore albo; Moris. v. 2. 322. sect. 3. t. 24. f. 19.)—Flowers solitary, sessile. Leaves oblong, smooth, obtuse, toothed or entire; the lower ones opposite. Stem erect. Style shorter than the lobes of the capsule.—Native of cultivated ground in several parts of Europe, Britain excepted, as well as of North America, Lima, and the Brazils, flowering in summer. The *root* is annual. *Herb* very variable in habit and size, sometimes partly decumbent; it is branched from the base, smooth in every part, rather succulent, vastly more like Purslane, than any species of *Polygonum*. *Leaves* an inch or more in length, for the most part sessile, some of them coarsely and distantly toothed, the upper or floral ones generally entire. *Flowers* nearly or quite sessile. Segments of the *calyx* oblong, bluntish, a little unequal. *Corolla* small, white. *Capsule* inversely heart-shaped, with a very short *style*, not reaching quite so far as the lobes. *Seeds* numerous, small, oval, flat.—Linnæus was singularly unfortunate with respect to this species and the *acinifolia*. His original specimen of *V. romana*, answering to the character, as well as the number, in Sp. Pl. ed. 1, is, notwithstanding Vahl's doubts, precisely the same as his *peregrina*, of which a third specimen is marked *acinifolia*; but this last specimen is not an original one. The synonyms of *romana* are properly referred in Sp. Pl. ed. 2. to *acinifolia*, so that the Linnæan *romana* is to be entirely excluded. Whether the *V. erecta acini folio glabro, floribus cæruleis, Dill. Giss. app.* 39, be the *acinifolia*, as commonly supposed, or the *præcox*, we have some doubts. *V. marilandica*, adopted from Gronovius, is universally allowed to be the *peregrina*, which therefore embraces three Linnæan species, none of them entitled to rank even as varieties of each other.

Veronica, in *Gardening*, comprises plants of the herbaceous, perennial, and shrubby kinds, among which the species cultivated are, the Siberian speedwell (V. sibirica); the Virginian speedwell (V. virginica); the bastard speedwell (V. spuria); the sea speedwell (V. maritima); the long-leaved speedwell (V. longifolia); the Welsh speedwell (V. hybrida); the cut-leaved speedwell (V. incisa); and the cross-leaved speedwell (V. decussata).

In the second sort the stems are terminated by long slender spikes of white flowers, which appear late in July; and it varies with the blush-coloured flowers. The third is perennial in root, having the stems terminated by long spikes of blue flowers, which appear in June and July. A variety of this has a flesh-coloured flower. The fourth has the stalks of less length than those of the preceding, but the flowers are of a bright blue, and appear in July. There are varieties with leaves opposite, in threes or in fours, with blue, blueish, flesh-coloured, and with white flowers. The fifth has the stems a foot and a half high, which are terminated by long spikes of blue flowers, which appear in June. The sixth has very white and woolly stalks about a foot high, the flowers of which are deep blue in terminating spikes. A variety has white flowers. The last sort is a bushy shrub, about two feet in height.

Method of Culture.—These plants may be raised by seed and parting the roots. In the annual sorts the seeds should be sown in the autumn, or very early spring, in the borders or places where the plants are to grow, being lightly covered in: if the seeds be permitted to scatter, good plants may be raised: sometimes they are sown on beds, to be afterwards removed. In the perennial sorts the roots may be parted in the autumn or early spring, and planted out where they are to grow, or in nursery rows to be afterwards removed. They should not be parted too small, or oftener than every two years: the large-growing sorts are proper for the borders, clumps, &c. and the trailing kinds for banks and shady slopes, or other similar places: they are hardy, and require only to be kept clean afterwards. The eighth sort is readily increased by cuttings in the spring and summer, being managed as a hardy greenhouse plant, in the same way as the myrtle. In very mild winters it sometimes stands secure in the open air. The annual and perennial sorts afford variety in the borders, clumps, and other parts of pleasure-grounds, and the last among plants of the hardy potted greenhouse kinds.

Veronica, in the *Materia Medica.* The *Beccabunga* was formerly used in several diseases, and applied externally to wounds and ulcers; but its supposed efficacy must depend on its antiscorbutic quality. As a mild refrigerant juice, it is deemed serviceable in an acrimonious state of the fluids; and it is ordered in the Lond. Ph. as an ingredient in the succus cochleariæ compositus. Its benefit depends on taking the juice in large quantities, or eating the fresh plant as food. The leaves of the *officinalis* have a weak, not disagreeable, smell, and a bitterish taste: an extract from them by rectified spirit is moderately bitter and astringent. About a century ago, this plant was much recommended as a substitute for tea: as a medicine, it had considerable reputation in coughs, asthmas, consumptions, &c.; but, as it is a less powerful astringent than many others, it is now disregarded. Lewis. Woodville.

VERONUS, in *Ichthyology*, a name given by many to a small river-fish, well known in England by the name of the *minow*.

VEROVITZA, in *Geography*, a town of Sclavonia. This is a strong town, situated near the Drave; 36 miles S.S.E. of Canischa.

VERPILLIERE, La, a town of France, in the department of the Isere; 5 miles S.E. of Lyons.

VERPLANK'S Point, a fortified spot in the state of New York, on the left bank of Hudson's river, in West Chester county, which was taken, in 1779, by the British troops; 34 miles N. of New York. N. lat. 41° 15′. W. long. 74°.

VERRANA,

VERRANA, a town of Naples, in the province of Otranto; 10 miles S.S.E. of Oria.

VERREGINUM, or VERRUGO, in *Ancient Geography*, a town of Italy, in Latium, in the country of the Volsci.

VERRETZ, in *Geography*, a settlement of the island of Hispaniola; 30 miles N.E. of St. Marc.

VERREZ, a town of France, in the department of the Dora, or in Piedmont, situated at the foot of a hill, on a stream of water, which divides into three branches, traversing the town on both sides, and the centre. The inhabitants have no other ramparts than the neighbouring mountains, and no other fosses than the beds of the rivers, made by nature: the houses are about 150 in number. In the most elegant part is a square fortress, built on a sharp rock, surrounded with a wall of stone, a parapet, and a good rampart, which surrounds the fortress and the gate of entrance, so that no one can arrive at this gate till they have passed the rampart and a drawbridge upon the fosse. When the bridge is up, the fortress is supposed to be impregnable, being surrounded on all sides with frightful precipices, while the access is only by narrow passes in the valley, which a small garrison can obstruct and annoy the enemy far and near; 15 miles S.S.E. of Aosta.

VERRIE'RES, a town of France, in the department of the Vienne; 13 miles S.E. of Poitiers.—Also, a town of France, in the department of the Marne; 3 miles S. of St. Menehould.—Also, a town of Neufchâtel, on the borders of France, the environs of which are famous for cheese. Near it is a narrow pass of only five feet wide, with inaccessible rocks on both sides; so that a few men could defend it against great numbers.

VERRIO, ANTONIO, in *Biography*, was born at Naples in 1634. After he had acquired the management of the pencil, he went to Toulouse, and there was engaged to paint the high altar in the church of the Carmelites. He was invited by Charles II. to England, the king intending to engage him in designs for tapestry, to be made here; but he changed his mind, and ordered him to paint most of the ceilings of Windsor castle, the great hall, and the chapel; all which he loaded with heterogeneous compounds of gods and goddesses, vices and virtues, and all the emblematic imagery which scholastic pomposity could muster up, to supply the place of common sense; and this he executed with great freedom and great freshness of colour, but in a manner devoid of any other good quality of art. For these labours he was paid nearly 6000*l.*

The Revolution was not to his mind: he declined to serve king William, and went to the earl of Exeter at Burleigh, where he painted several apartments, which are esteemed his best works. He afterwards painted at Chatsworth, and at Lowther: at length he was persuaded by the earl of Exeter to engage to paint for the king the great staircase at Hampton-Court; and Walpole observes, "he painted it as ill as if he had spoiled it out of principle." His eyes failing him, queen Anne gave him a pension of 200*l. per annum* for life; but he did not long enjoy it, dying at Hampton-Court in 1707.

VERRO, in *Geography*, a town of Russia, in the government of Riga; 124 miles N.E. of Riga. N. lat. 58° 10'. E. long. 27° 24'.

VERROCHIO, ANDREA, in *Biography*, was among the early Florentine artists who prepared the way for the greater talents of subsequent painters. He was born at Florence in 1432, and distinguished himself both as a sculptor and painter. He had the honour to be the instructor of P. Perugino and Lionardo da Vinci, and was much employed; till, as Vasari reports, being engaged by the monks of St. Salvi, at Valombrosa, to paint a picture of the Baptism of Christ, he set Lionardo da Vinci, then his pupil, to put in the figure of an angel from his design, and he executed his task in a manner so superior to the work of his master, that Verrochio, in disgust, resolved to paint no more, but apply himself entirely to sculpture and drawing. His style of design was grand and free, and Lionardo took great pleasure in copying his drawings, particularly a battle-piece, on account of the peculiar airs of the heads, the disposition of the hair, and the actions of the figures. He died in 1488, aged 56.

VERRUA, in *Geography*, a town of Piedmont, or lately of France, in the department of the Tanaro, on a high hill, near the Po, opposite Crescentin: the fortifications were once very strong, and the castle was called impregnable; 18 miles N.E. of Turin. N. lat. 45° 14'. E. long. 8°.

VERRUCA, in *Medicine*. See WART.

Hence, verrucous is applied to any excrescences which have a resemblance to warts. There are also verrucous ulcers, &c.

VERRUCARIA, in *Botany*, so called by Persoon, from *verruca*, a wart, in allusion to the protuberant form of its fructification. The same name had been previously applied by Wiggers in his *Primitiæ Fl. Holsat.* 85, in an extremely vague manner, to many of the crustaceous Lichens of Linnæus; but it is now limited, as Persoon intended, to a very natural genus.—Pers. in Ust. Annal. fasc. 7. 23. Schrad. Spicil. 108. Achar. Prodr. 13. Meth. 113. "Lichenogr. 51. t. 4. f. 2, 3." Syn. 87.—Class and order, *Cryptogamia Algæ*. Nat. Ord. *Lichenes*.

Gen. Ch. *Frond* crustaceous, expanded, flat, uniform, closely attached. *Receptacles* nearly globose, or somewhat hemispherical; their base sunk in the frond; their coat double; outermost rather cartilaginous, thick, black, clothing the upper, or exposed, half, and furnished with a small prominent mouth; inner very thin and membranous, entirely inclosing a globular, cellular *nucleus*.

Eff. Ch. Frond crustaceous. Receptacles half-immersed, globose, concave, black, with a cellular nucleus.

We have, under ENDOCARPON, adverted to the near agreement between the fructification of that genus and the present. Their habits and fronds however are very different, and Schrader has long ago indicated another distinction, that the *receptacle* is always closed in *Verrucaria*, while in *Endocarpon* its contents are discharged, he says "exploded," by a small, but distinct, orifice. On these characters this great cryptogamist would found his generic distinctions, regardless of the nature of the *frond*, and the greater or less degree of prominence of the *receptacles* sunk therein. But the learned Acharius, so peculiarly devoted to this difficult department of botany, has defined *Verrucaria* by more obvious, and as we think more natural limits, by which we have profited above. He defines forty-five species of this genus, in his latest publication, the *Synopsis Methodica Lichenum*. They are distributed into four sections, according to the nature of the *crust*, or *frond*.

Sect. 1. *Frond membranous, or somewhat cartilaginous, contiguous and smooth.* Twenty-one species.

These all grow on the smooth barks of various trees, in Europe, Africa or America, in the form of a thin inseparable membrane, generally of a different colour from the cuticle of the bark, by which, more than the black dot-like fructification, these plants are generally rendered conspicuous. Examples of this section are

V. *punctiformis*. Ach. Syn. n. 1. (Lichen punctiformis; Engl. Bot. t. 2412. L. myacoproides; Ehrh. Crypt. 264.)—Crust determined, very thin, smooth, rusty-brown. Receptacles

ceptacles minute, black, hemiſpherical, umbilicated.—Found by Mr. W. Borrer, on the ſmooth bark of aſh-trees.

V. *analepta*. Ach. n. 2. (Lichen analeptus; Engl. Bot. t. 1848.)—Differs from the foregoing chiefly in the central depreſſion of the *receptacles* being more minute.

V. *gemmata*. Ach. n. 12. Meth. 120. t. 3. f. 1. (V. melaleuca; ibid. 117. V. alba; Schrad. Spicil. 109. t. 2. f. 3.)—Cruſt undefined, thin, ſmooth, of a hoary white. Receptacles ſcattered, hemiſpherical, poliſhed, beaked; nucleus globular, pellucid.—Found on the barks of the taller kinds of trees. *Acharius*. Mr. D. Turner has met with this ſpecies in England. The black and ſhining prominent *receptacles* are ſtrongly contraſted with the white, ſomewhat mealy, cruſt.

Sect. 2. *Frond rather ſolid, more or leſs gelatinous.* Three ſpecies.

V. *mucoſa*. Ach. n. 22. Meth. ſuppl. 23. "Wahlenb. Lapp. 466."—Cruſt gelatinous and ſlimy, very ſmooth, blackiſh-green. Receptacles minute, nearly globular, ſunk, with a prominent beak; dirty white internally.—Found by Mr. Wahlenberg, on rocks and ſtones waſhed by the mountain ſtreams of Lapland and Sweden. When dry it is hard and almoſt black, but moiſture reſtores the *cruſt* to a ſlimy ſtate, and the *fructification* is viſible, in both ſtates, to a careful obſerver.

The other ſpecies of this ſection are named *gelatinoſa* and *ceuthocarpa*.

Sect. 3. *Cruſt ſomewhat tartareous and friable, uninterrupted, cracking into ſmall portions, or powdery.* Seventeen ſpecies.

V. *Schraderi*. Ach. n. 25. Meth. 114. (V. rupeſtris; Schrad. Spicil. 109. t. 2. f. 7. Lichen Schraderi; Engl. Bot. t. 1711. L. immerſus; Hoffm. Enum. Lich. 24. t. 3. f. 5. L. fuſco-ater β; Hag. Lich. 49.)—Cruſt tartareous, hard, whitiſh, ſmooth. Receptacles minute, crowded, nearly globular, umbilicated, ſunk; ſemitranſparent within.—This is often to be ſeen on chalk or lime-ſtone. The cavities in the very hard *cruſt*, ſeem formed by the growth of the *receptacles*, and remain empty and uncloſed after the latter fall out; juſt as happens in the true *Lichen immerſus*, or *Lecidea immerſa*. In this ſtate our preſent *Verrucaria* may frequently be obſerved, on wrought ſtones in expoſed ſituations; its hard *cruſt* being ſcarcely diſtinguiſhable from the ſtone, except by its internal green hue when rubbed.

V. *Harrimanni*. Ach. n. 26. Lichenogr. v. 1. 284. (Lichen Harrimanni; Engl. Bot. t. 2539.)—Cruſt tartareous, contiguous, limited, mouſe-coloured, with very minute depreſſed dots. Receptacles minute, immerſed, globoſe, with a prominent bordered orifice; browniſh within.—Native of hard, grey, calcareous rocks, in the county of Durham, where it was diſcovered by the Rev. Mr. Harriman, a very ſkilful Britiſh botaniſt. The *cruſt* of this is thicker, with a more defined black edge than uſual in *Verrucariæ*, yet it cannot be ſeparated in any entire portions from the ſtone. The dotted ſurface is peculiar. The dilated rim of each *receptacle* is all that is viſible of the fructification.

V. *maura*. Ach. n. 36. Meth. ſuppl. 19. (Lichen maurus; Engl. Bot. t. 2456.)—Cruſt thin, continued, imperfectly circumſcribed, coal-black, ſmooth, with innumerable minute cracks. Receptacles black, immerſed, ſwelling under the cruſt, marked by an umbilicated point; nucleus blackiſh.—Mr. W. Borrer has noticed this frequently on rocks on the Scottiſh coaſt, and his ſpecimens agree with thoſe ſent by Mr. Wahlenberg, the original diſcoverer of the preſent ſpecies, on the rocky ſhores of Sweden. It compoſes ſooty inſeparable blotches, on ſtones expoſed to the flux and reflux of the tide; but when examined, will be found as diſtinct in characters as any of its tribe.

Sect. 4. *Cruſt ſoft, fibrous, ſomewhat ſpongy, or like a thin cobweb.* Four ſpecies.

V. *epigæa*. Ach. n. 43. Meth. 123. (Sphæria epigæa; Perſ. Syn. Fung. append. 27. Lichen terreſtris; Engl. Bot. t. 1681.)—Cruſt ſomewhat fibrous, gelatinous, uneven, pale greeniſh-grey. Receptacles minute, globoſe, immerſed, with a prominent orifice; internally black.—Not unfrequent on earthy or muddy banks. When dry the *cruſt* is ſmooth and even, without any ſign of the fibrous texture, which becomes viſible on the admiſſion of wet. The *receptacles* are ſcattered like little black dots over the ſurface, being moſt prominent in a dry ſtate.

V. *byſſacea*. Ach. n. 45. Meth. 116. (Sphæria byſſacea; Weigel Obſ. Bot. 42. t. 2. f. 9. Perſ. Syn. Fung. append. 27.)—Cruſt ſomewhat leprous and fibrous, dirty white. Receptacles minute, nearly globular, half immerſed, perforated; black within.—On the trunks of old oaks, and other trees. This ſeems to be a very doubtful *Verrucaria*. We have never examined it, but the *cruſt* is deſcribed more of a leprous than fibrous texture, reſembling *Byſſus lactea* of Linnæus. *Receptacles* full of black powder. It is one of thoſe ambiguous productions, partly allied to the *Lichenes*, partly to the *Fungi*, which the ſtudents of each tribe preſs into their own ſervice. From an attention to the fibrous baſes of ſome other *Sphæriæ*, we ſhould incline to think this a *fungus*, eſpecially if the *receptacles* be really full of powder: but on the other hand, the mealineſs of the *cruſt* is much more of the nature of the genus under conſideration. Acharius now conſiders as a variety of this, his *V. ſticica*, Meth. 118; and indeed they appear very nearly akin.

VERRUCINI, in *Ancient Geography*, a people of the Maritime Alps, N.W. of the Sueltari, mentioned by Pliny. They are placed at Verignon.

VERRUCOLA, La, in *Geography*, a town of Etruria; 4 miles E. of Piſa.

VERRUCOSUS, *Warty*, in *Botany* and *Vegetable Phyſiology*, is a term applied to any part of the ſurface of a plant when furniſhed with ſcattered protuberances from its own ſubſtance. *Euonymus verrucoſus* of Scopoli and Jacquin has a warty bark. The young branches are firſt beſprinkled with little black ſhining oblong ſpecks, which ſoon enlarge, crack longitudinally, and become tumid rough warts, having much more of the appearance of a paraſitical *fungus*, than many productions that are ſo denominated. In *Aloe perlata* the cuticle of the leaves is ſtudded with hard cartilaginous ſmooth warts, exhibiting a moſt genuine example of a *folium verrucoſum*. So in *Echium*, ſeveral ſpecies bear hard, almoſt bony or ſhelly, warts, ſometimes elegantly ſtellated, from which the briſtly clothing of the herbage originates. Theſe are all leſs ſtrong and remarkable, the more luxuriant the plant. The papillary coat of the Ice-plant, *Meſembryanthemum cryſtallinum*, can ſcarcely come under the above denomination; being an aſſemblage of cuticular bladders full of a watery fluid, without any cuticular or fleſhy ſolidity.

VERRUYE, in *Geography*, a town of France, in the department of the Two Sevres; 7 miles N.N.W. of St. Maixens.

VERRY, in *Heraldry*. See Vairy.

VERS *du Gard*, in *Geography*, a town of France, in the department of the Gard; 6 miles S.E. of Uzes.

Vers *en Montagne*, a town of France, in the department of the Jura; 18 miles N.E. of Lons le Saunier.

VERSA. See Vice *Verſâ*.

VERSAILLES, in *Geography*, a city of France, and capital of the department of the Seine and Oiſe. In the beginning of the laſt century, it was a ſmall village, when

Louis XIII. built here a hunting seat, which Louis XIV. enlarged into a palace, in a forest 30 miles in circumference, which became a place of frequent residence of the royal family till the revolution. The palace is magnificent, with beautiful gardens, adorned with statues, canals, fountains, &c. and a park five miles in circumference, surrounded with a wall. Since the revolution, it has been erected into a bishop's see; 3 posts S.W. of Paris. N. lat. 48° 49'. E. long. 2° 11'.

VERSAILLES, a township of Pennsylvania, in the county of Allegany; containing 883 inhabitants.—Also, a town of Woodford county, in the state of Kentucky; containing 488 inhabitants.

VERSAK, a district of Asiatic Turkey, in the S. part of Caramania, so named from a mountain, 60 miles S.E. of Cogni.

VERSAMEYRA, a town of Hindoostan, in Cutch; 20 miles E. of Boogeboogе.

VERSARA, a town of Hindoostan, in Guzerat; 32 miles S. of Amedabad.

VERSAUL, a town of Hindoostan, in Guzerat; 6 miles N. of Pernalla.

VERSCHORISTS, in *Ecclesiastical History*, a religious sect, deriving its denomination from Jacob Verschoor, a native of Flushing, who, in the year 1680, out of the tenets of Cocceius and Spinosa, produced a new form of religion; for the leading tenets of which see HATTEMISTS.

The disciples of Verschoor were also called Hebrews, on account of the zeal and diligence with which they applied themselves to the study of the Hebrew language.

VERSE, VERSUS, in *Poetry*, a line or part of a discourse, consisting of a certain number of long and short syllables, which run with an agreeable cadence; the like being also reiterated in the course of the piece.

This repetition, according to F. Bossu, is necessary to distinguish the notion of verse from that of prose; for in prose, as well as verse, each period and member are parts of discourse, consisting of a certain number of long and short syllables; only, prose is continually diversifying its measures and cadences, and verse regularly repeats them.

This repetition of the poets appears even in the manner of writing; for one verse being finished, they return to the beginning of another line to write the verse following: and it is to this return that verse owes its name; *versus* coming from *vertere*, to *turn* or *return*.

Accordingly, we find the same word used to signify any thing that is placed in a certain regular order: Cicero uses *versus* for a line in prose; Virgil for a row of trees, and even of oars in a galley. But as the regularity of verse carries with it more charms, and requires a greater degree of exactness, the word has, in time, become appropriated to poetry.

To make verse, it is not enough that the measures and quantities of syllables be observed, and six just feet put, one after another, in the same line; there are farther required certain agreeable cadences, particular tenses, moods, regimens, and even sometimes words unknown in prose.

But what is chiefly required, is an elevated, bold, figurative manner of diction; this manner is a thing so peculiar to this kind of writing, that, without it, the most exact arrangement of longs and shorts does not constitute verse so much as a sort of measured prose. See POETRY.

Dr. Blair (Lectures, vol. iii.) observes, that nations, whose language and pronunciation were of a musical kind, rested their versification chiefly upon the quantities, that is, the length or shortness of their syllables. Others, who did not make the quantities of their syllables to be so distinctly perceived in pronouncing them, rested the melody of their verse upon the number of syllables it contained, upon the proper disposition of accents and pauses in it, and frequently upon that return of corresponding sounds which we call *rhyme*; which see. The former was the case with the Greeks and Romans; the latter is the case with us, and with most modern nations.

The Greek and Latin verses consist of a certain number of feet, disposed in a certain order; so that every syllable, or the greatest number at least, was known to have a fixed and determined quantity; and their manner of pronouncing rendered this so sensible to the ear, that a long syllable was counted precisely equal in time to two short ones. Upon this principle, the number of syllables contained in their hexameter verse was allowed to vary. The musical time, however, was precisely the same in every such verse, and was always equal to that of twelve long syllables. In order to ascertain the regular time of every verse, and the proper mixture and succession of long and short syllables which ought to compose it, were invented what the grammarians call metrical feet, dactyles, spondees, iambics, &c. And the hexameter verse was scanned or measured by six metrical feet, either dactyles or spondees, with this restriction, that the fifth foot was regularly to be a dactyle, and the last a spondee. And some have attempted to make French and English verses on the same foundation, but without success.

The introduction of these feet into English verse would not suit the genius of our language, which does not correspond, in this respect, to the Greek or Latin. Hence mere quantity is of little effect in English versification. The only perceptible difference among our syllables is owing to that stronger percussion of voice, called accent, with which some of them are uttered: and accordingly, the melody of our verse depends much more upon a certain order and succession of accented and unaccented syllables, than upon their being long or short.

If we take any of Mr. Pope's lines, and, in reciting them, alter the quantity of the syllables as far as our quantities are sensible, the music of the verse will not be much altered; but if we do not accent the syllables as the verse dictates, its melody will be totally destroyed. (See Lord Monboddo's Treatise of the Origin and Progress of Language, vol. ii.) In the constitution of our verse, the cæsural pause is an essential circumstance, and this falls towards the middle of each line. In the French heroic verse this is very sensible. This is a verse of twelve syllables, and in every line, just after the sixth syllable, there falls, regularly and indispensably a cæsural pause, dividing the line into two equal hemistichs. Thus the one-half of the line always answers to the other, and the same chime returns incessantly on the ear, without intermission or change; which is, without doubt, a defect in their verse, and renders it unfit for the freedom and dignity of heroic poetry. For the difference of the English verse in this respect, see PAUSE. See also ACCENT, PROSODY, and QUANTITY.

Vossius is very severe on the modern verse, and makes it altogether unfit for music: our verses, says he, run all, as it were, on one foot, without distinction of members or parts, and without regard to the natural quantities of syllables. We have no rhythmus at all; and we mind nothing, but to have a certain number of syllables in a verse, of whatever nature, and in whatever order.

Mr. Malcolm vindicates our verse from this imputation. It is true, he says, we do not follow the metrical composition of the ancients; yet we have such a mixture of strong and soft, long and short syllables, as makes our verse flow smooth

ſmooth or rumbling, ſlow or rapid, agreeable to the ſubject. Inſtances of all which we have in the following lines.

" Soft is the ſtrain when Zephyr gently blows.
The hoarſe rough verſe ſhould, like the torrent, roar.
The line too labours, and the words move ſlow.
Flies o'er th' unbending corn, and ſkims along the main."

By making a ſmall change, or tranſpoſition of a word or ſyllable in any of theſe verſes, any body who has an ear will find, that we make a great matter of the nature and order of the ſyllables.

Voſſius adds, that the ancient odes were ſung, as to the rhythmus, (ſee RHYTHM,) in the ſame manner as we ſcan them; every *pes* being a diſtinct bar, or meaſure, ſeparated by a diſtinct pauſe, though, in reading, that diſtinction was not accurately obſerved.

Laſtly, he obſerves, that their odes had a regular return of the ſame kind of verſe; and the ſame quantity of ſyllables in the ſame place of every verſe; whereas, in the modern odes, to follow the natural quantity of our ſyllables, every ſtanza would be a diſtinct ſong.

It is next to impoſſible to write proſe without ſometimes intermixing verſe with it; ſo that Vaugelas's rule, which enjoins us to avoid them, is next to impracticable. This may be farther ſaid, that for ſhort verſes they are ſo little perceived, that it is ſcarcely worth one's while to ſtrain one's ſelf to avoid them; and as to long verſes, they are chiefly to be avoided in the ends of periods, for, in the middle, they are ſcarcely felt. In the general, rules of this kind muſt be conſidered as principally regarding numerous verſes, and ſuch as are readily diſtinguiſhed by their cadence: thus, in Latin, it is ſcarcely poſſible to avoid iambic verſes; but hexameters muſt, by all means, be avoided, their cadence being more ſenſible and more ſtudied.

Verſes are of various kinds; ſome denominated from the number of feet of which they are compoſed; as the *monometer, dimeter, trimeter, tetrameter, pentameter, hexameter, hendecaſyllabum*, &c. Some from the kinds of feet uſed in them; as the *pyrrhichian, proceleuſmatic, iambic, trochaic, dactylic, anapæſtic, ſpondaic* or *moloſſean, choriambic, iambidactylic*, or *dactylotrochaic*. Sometimes from the names of the inventors, or the authors who have uſed them with moſt ſucceſs: as the *Anacreontic, Archilochian, Hipponactic, Pherecratian, Glyconian, Alcmanian, Aſclepiadean, Alcaic, Steſichorian, Phaliſcan, Ariſtophanian, Callimachian, Galliambic, Phalæcian*, and *Sapphic*. Sometimes from the ſubject, or the circumſtances of the compoſition; as the *heroic, elegiac, Adonic*, &c. See HEXAMETER, PENTAMETER, IAMBIC, &c.

In reckoning the feet of iambics, trochaics, and anapæſtics, each meter is a dipody, or comprehends two feet. In other verſes, a meter is but a ſingle foot. Hence it is that the iambic trimeter is alſo called *ſenarium*, becauſe compoſed of ſix feet. See VERSIFICATION, *infra*.

The ancients invented various kinds of poetical devices in verſe, as *centos, echoes*, and *monorhymes*.

VERSE, *Alexandrin* or *Alexandrian*. See ALEXANDRIN.

VERSE, *Blank*, is a noble, bold, and diſencumbered ſpecies of verſification; free from that full cloſe which rhyme forces upon the ear at the end of every couplet, and allowing the lines to run into each other, with as great, if not greater, liberty than the Latin hexameter. Accordingly it is ſuited to ſubjects of dignity and force, which demand more free and manly numbers than rhyme. The conſtraint and ſtrict regularity of rhyme are unfavourable to the ſublime, or to the highly pathetic ſtrain. An epic poem or a tragedy would be fettered and degraded by it. As this kind of verſe is naturally read with leſs cadence or tone than rhyme, the pauſes in it, and the effect of them, are not always ſo ſenſible to the ear. It is conſtructed, however, entirely upon the ſame principles, with reſpect to the place of the pauſe. See PAUSE.

VERSES, *Concordant, Dactylic*, and *Elegiac*. See the adjectives.

VERSES, *Equivocal*, thoſe where the ſame words contained in two lines carry a different ſenſe.

VERSES, *Feſcennine*. See FESCENNINE.

VERSE, *Heroic*. See HEROIC.

Our Engliſh heroic verſe is of that kind which may be denominated iambic ſtructure; that is, compoſed of a nearly alternate ſucceſſion of ſyllables, not ſhort and long, but unaccented and accented. The line often begins with an unaccented ſyllable, and ſometimes, in its courſe, two unaccented ſyllables follow each other. But, generally, there are either five or four accented ſyllables in each line. The number of ſyllables is ten, unleſs an Alexandrian verſe be occaſionally admitted. In the Italian heroic verſe employed by Taſſo in his Gieruſalemme, and Arioſto in his Orlando, the pauſes are of the ſame varied nature with thoſe that belong to Engliſh verſification. See PAUSE, and VERSIFICATION, *infra*.

VERSES, *Metrical*. See METRICAL.

VERSES, *Reciprocal*, are thoſe which read the ſame backwards as forwards. See RETROGRADE.

VERSES, *Rhopalic, Serpentine*, and *Technical*. See the adjectives.

VERSE is alſo uſed for a part of a chapter, ſection, or paragraph, ſubdivided into ſeveral little articles.

The whole bible is divided into chapters; and the chapters are divided into verſes.

The five books of the law are divided into fifty-four ſections. See PARASCHE and PENTATEUCH.

Many of the Jews maintain, that this was one of the conſtitutions of Moſes from mount Sinai; and ſome modern Chriſtian writers, ſuch as Buxtorf, Leuſden, Pfeiffer, and their admirers, inſiſt upon it, that the diviſion of the verſes of the Old Teſtament was not a work merely human, but had the peculiar privilege of being fixed by the inſpired author of each book, or at the lateſt by Ezra. Others, with greater probability, aſcribe it to Ezra, and ſay that it was made for the uſe of the ſynagogues, in which one ſection was read every Sabbath-day, and thus the whole law read over every year. When the Jews were forbidden, in the time of the perſecution of Antiochus Epiphanes, to read the law, they ſubſtituted in its room fifty-four ſections out of the prophets, which were afterwards continued; and when the reading of the law was reſtored by the Maccabees, the ſection which was read every Sabbath out of the law, ſerved for their firſt leſſon, and that out of the prophets for their ſecond leſſon; and ſo it was practiſed in the time of the apoſtles.

Theſe ſections were divided into verſes, which the Jews call *peſukim*. They are marked out in the Hebrew bibles by two great points at the end of them, called *ſoph-paſuk*, *i. e. the end of the verſe*. If Ezra was not the author of this diviſion, it is certainly very ancient, and was probably invented for the ſake of the Targumiſts, or Chaldee interpreters. Mention is made of theſe verſes in the Miſchna. Prideaux's Conn. vol. ii. p. 479. For the more modern diviſion, ſee CHAPTERS.

That the modern diviſion could not be of inſpired authority is undeniable, for no inſpired author could ſeparate words which the ſenſe determines to be inſeparable, ſeveral inſtances of which occur.

It is probable, ſays Dr. Kennicott (State of the printed Hebrew

Hebrew Text, vol. i.), that the division of the verses of the Old Testament has been different at different times; and it seems certain, that verses were not the same in St. Jerom's time as at present: for that learned father, in his preface to the book of Job, observes, that there were seven or eight hundred verses (some think the true reading to be seventy or eighty) wanting in the ancient Latin translation of that book; which cannot be easily supposed of such verses as the present, the whole book containing no more than one thousand and seventy of our verses. But the nature of verses having varied, and the present verses, as terminations of, or pauses in the sense, having been probably fixed in the Hebrew text, or in the Greek version, some ages after the publication of the books of the Old Testament, as they confessedly were with regard to the New Testament; we shall the less wonder that some of the wiser Jews made no scruple to alter the received division where they found it to be erroneous. F. Simon tells us that Elias Levita, the best Jewish critic, affirms, the present distinction of verses was made by the Masoret Jews, after the Talmud; and that Aben-Ezra mentions amongst others, R. Moses Cohen, a learned grammarian, who took the liberty of joining some verses of the bible otherwise than they were joined by those who had marked them; affirming that they were mistaken in those places.

The division of chapters into verses has been found so convenient, that it has been used in all the editions of the bible, ever since it was first introduced. It is not, however, without its disadvantages. By this division the sense is often interrupted, and the reader may be thus led into mistakes, by fancying that every verse completes the sense. Besides, some persons are hence led to conceive, that every verse contains a mystery, or some essential point, though there is frequently no more than some incident or circumstance recorded in that place. Moreover, it has proved the occasion of that wrong method which sometimes prevails among preachers. Many imagine that one verse is a sufficient subject for a sermon; and when they find that it does not furnish solid and instructive reflections enough, they are constrained to wander from their point, and in order to fill up their discourse, display their wit and learning, which often administer but little edification to their hearers, and is undoubtedly contrary to the end of preaching.

It is then much to be wished, that some judicious person would divide the chapters otherwise than they are at present divided. If the verses were suffered to remain, they should be so divided, as to make always a complete sense, though on this account they might happen to be longer or shorter than they now are. But perhaps it would be better to suppress the verses entirely, and to divide the chapters into certain articles, which should contain such a number of verses as would complete the sense. When any word or passage of scripture is quoted, it would be no great trouble to look over a whole article, which could not require much time. To which we may add, that such a method of division would much assist the memory, which is now overburdened with such a great number of verses as preachers are, occasionally, obliged to remember.

The division of verses in the New Testament was first made by Robert Stephens; and so negligently was it done, that his son, Henry Stephens, assures us, he worked at it as he travelled from Paris to Lyons. Many learned men find great fault with this division, and yet it is every where followed.

F. Simon observes, that the Greeks and Latins meant by verse, a line, containing a certain number of words. He adds, that the authors of those days, to prevent any thing being added or taken away from their works, used to mark, at the end, the number of verses they contained; but the books themselves were written all running, without any division, points, or the like.

Verse, *Neck*. See Neck-*Verse*.

Verse, in *Church Music*: as, a verse anthem is distinct from a solo anthem, an anthem for two or three voices, and from a full anthem. A verse anthem consists of chorusses, with solo movements between them, for one, two, or three voices, so that in this sense verse is equivalent with solo.

VERSED *Sine of an Arch*. See *Versed* Sine.

Co-Versed *Sine*. See Co-versed *Sine*.

VERSHIRE, in *Geography*, a town of Vermont, in the county of Orange, containing 1311 inhabitants; 16 miles N. of Hanover.

VERSHOCK, or Wershock, a Russian measure equal to $1\frac{3}{4}$ of an English inch. An arsheen is divided into 16 vershocks, or wershocks, and equals 28 Eng. inches: thus 9 arsheens = 7 Eng. yards, and 4 vershocks = 7 Eng. inches. A face, fashe, or fathom, is = 3 arsheens, or 7 Eng. feet.

VERSIFICATION, the art or manner of making verse; also the tune and cadence of verse.

Versification is properly applied to what the poet does more by labour, art, and rule, than by invention, and the genius, or furor poeticus. See Poetry.

The matter of versification is long and short syllables, and feet composed of them; and its form is the arrangement of them in correct, numerous, and harmonious verses; but this is no more than a mere translator may pretend to, and which the Catilinarian war, put in measure, might merit.

It is with reason, therefore, that these simple matters are distinguished from the grand poetry, and called by the name versification.

In effect, there is much the same difference between grammar and rhetoric, as there is between the art of making verses, and that of inventing poems.

History of Versification.—It appears that verse has been cultivated from the earliest period of literature, and among all people, from the most barbarous to the most refined; and to it principally we are indebted for most of the original accounts we have of the ancient nations of the earth. Equally measured lines, with an harmonious collocation of expressive and sometimes highly metaphorical terms, the alternate lines either answering to each other in sense, or ending with similar sounds, were easily committed to memory, and easily retained. As these were often accompanied with a pleasing air or tune, the subject being for the most part a concatenation of striking and interesting events, histories formed thus, became the amusement of youth, the palliative of labour, and the solace even of old age. In such a way, the histories of most nations have been preserved. The interesting events celebrated, the rhythm or metre, and the accompanying tune or recitativo air, rendered them easily transmissible to posterity; and by means of tradition, they passed safely from father to son, through the times of comparative darkness, when the various tribes of mankind had no method more effectual of communicating to their descendants the principles of their worship, their religious ceremonies, their laws, and the renowned actions of their sages and heroes, till they arrived at those ages in which the *pen* and the *press* have given to them, by multiplying the copies, a sort of deathless duration.

The propriety of assigning the priority to Hebrew versification is obvious. The most intelligent consider the Hebrew to have been the primeval language, or at least the most ancient of which we have any knowledge; and, therefore, it is here that we must look for the earliest dawn of the poetic art. The address of Lamech (Gen. iv. 23.), which is in hemistichs in the original, is doubtless the most ancient verse in the world.

Of the ſame kind is Noah's prophecy concerning his ſons (Gen. ix. 25—27.), Jacob's bleſſing to the twelve patriarchs (Gen. xlix. 2—27.), the ſong of Moſes (Exod. xv.); and the book of Job, of Pſalms, the ſongs of Solomon, Iſaiah, &c. afford ample proof not only of the exiſtence of verſe among the ancient Hebrews, but that in its origin and earlier hiſtory it was intimately connected with muſic; that is, it was frequently ſet to ſome air or tune, for vocal or inſtrumental performance.

Having thus pointed out the origin of verſe, at an early period, among the Hebrews; we ſhall now endeavour to trace its riſe amongſt other nations, aſſigning the precedence chiefly to thoſe where we are moſt likely to find it in a *native*, rather than in a *borrowed* or *ingrafted* ſtate.

Tcho-Yong, the ſixteenth emperor of the ninth period, is the firſt on record among the Chineſe for his attachment to the Muſes. Feu-Hi compoſed verſes on the piſcatorial art. Chin-Nong, a ſucceeding emperor, wrote verſes on the fertility of the earth. Here we find what is frequently remarkable in the early hiſtory of the ancients, the office of a chief or legiſlator and bard or poet united in one perſon: for many of the ancient poems were of a legiſlative caſt, and contained, in verſe, the moſt eſſential parts of their religious, moral, and political ſyſtems. The laſt emperor whom we find to have retained the poetical character was Chao-Hao. After him the complex office ſeems to have ſeparated, as the next bard we meet with is in the perſon of the philoſopher Confucius, who lived about ſix hundred years before the Chriſtian era. (See Extraits des Hiſt. Chinois, and Du Halde Hiſt. Chinois.) The Chineſe ode, therefore, tranſlated by ſir William Jones, muſt be of high antiquity, as Confucius conſidered it as very ancient in his time. About one century before the ſame epoch, Calidas, who has been termed the Shakſpeare of India, wrote his poems. Such being the ſtate of oriental verſe at theſe early periods, it is not more than we might expect, that the Portugueſe miſſionaries ſhould meet with it on the coaſt of Proper India, where they found the natives poſſeſſed of a ſpecies of rude verſe ſet to muſic. They compoſed, in the Malabar tongue, a long ode, containing a hiſtory of the Portugueſe prelate, and a deſcriptive detail of what had paſſed at his ſynod. This nation had preſerved the ancient cuſtom of tranſmitting to poſterity, by this kind of poem, all the moſt remarkable events. (La Croze's Hiſt.) The miſſionaries, who viſited the oppoſite coaſt of Coromandel, give us ſufficient proof that the culture of verſe was not inconſiderable at that early period. (Lettres Ediſiantes, rec. xviii. p. 28.) With reſpect to Egypt, the origin of the belles lettres is ſo loſt in the antiquity of that famous kingdom, that we know nothing of the firſt advances made there in verſe. We naturally expect that it met with the fate of its kindred ſcience, muſic; which, in an early period, had all its forms unalterably fixed by law, and, therefore, improvement and corruption were alike prevented.

In adverting to thoſe points of the poetic horizon, where we are moſt likely to deſcry the early dawn of the art of verſe, it is now incumbent on us to notice the Arabs, whoſe language, from its manifeſt affinity, unqueſtionably had a common origin with the Hebrew and Chaldaic; and, conſequently, is one of the moſt ancient in the world. Count Reviczki, however, was of opinion, that with reſpect to the metrical art of the Arabs, it was an invention of a date much later than that of the Hebrews, and that it aſſumed its form only a ſhort time before Mohammed. At the beginning of the ſeventh century, the Arabic language was brought to a high degree of perfection, by a ſort of poetical academy, that uſed to aſſemble at ſtated times in a place called Ocadh, where every poet produced his beſt compoſition, and met with the applauſe which it deſerved. The moſt excellent of theſe poems were tranſcribed in characters of gold upon Egyptian paper, and hung up in the temple of Mecca, whence they were named mozahebat, or *golden*, and moallakat, or *ſuſpended*. The poems of this ſort were called caſſeidas, or eclogues, ſeven of which are preſerved in our libraries, and are conſidered as the fineſt that were written before the time of Mohammed. Concerning the Arabic and oriental verſe in general, count Reviczki remarks, that he "anticipates the mortification of all our European poets, when they diſcover that the oriental dialects had a greater variety of feet, and conſequently the true ſcience of metre and proſody." After the above-mentioned period, however, the Muſes diſſeminated their gifts with a prolific hand, and many were ſignalized with their favours. Amongſt the reſt, the caliph Almamon, ſometimes termed the Arabian Auguſtus, for the protection he afforded to the belles lettres, bore an early and a diſtinguiſhed rank. We have only to conſult the abbé Andres, in his luminous work "Dell' Origine, de' progreſſi e dello Stato attuale d'Ogni Letteratura," to aſſure ourſelves, on the authority of the authentic manuſcripts which he cites, that the Arabs had now become pre-eminent for their cultivation of the Muſes. Scoppa affirms that there is no exaggeration in the expreſſion of the "Hiſtoire de la Poeſie Françaiſe," which, from undoubted evidence, aſſerts "that there had been more poets amongſt the Arabs than in all the reſt of the world." Abilabba-Abdalla, ſon of the caliph Motaz, recapitulates the lives of an hundred and twenty-one poets of the firſt rank. Another work, entitled "Théatre des Poëtes," forms a library of twenty-four volumes. Caſiri, the celebrated author of the "Bibliothèque Arabico-Hiſpana de l'Eſcurial," does not heſitate to maintain that the excellencies of the Arabian poets roſe as high in the ſcale of merit as thoſe of the Greeks and Latins.

In our endeavour to trace the hiſtory of verſification, where it is more likely to be found in its native and unborrowed ſtate, we now turn to the northern nations of Europe. Tacitus mentions the verſe and hymns of the Germans, at a time when that rough people inhabited the woods, and whilſt their manners were yet ſavage. The Arthur of Teutonic romance is the hero Dieterich of Berne, who lived about the year 450 A.D. It is thought that his deeds of high enterpriſe were ſung in the ancient and barbarous verſes, ſome of which were collected by Charlemagne. The flight of Theodoric to the Huns is related in an exceedingly curious fragment, from the language and metre of which we infer, it muſt have been compoſed in the eighth century. We learn from a Latin fragment, written by Du Cheſne, that Lewis the Pious, ſon of Charlemagne, being deſirous that all his ſubjects ſpeaking the Theotiſc language ſhould be enabled to read the ſcriptures, "ordered a Saxon, who was reputed to be no vulgar bard, to make a *poetical* tranſlation of the Old and New Teſtament into the German tongue." It is ſuppoſed by Eccard and the German philologiſts, that the "Harmony of the four Evangeliſts," in the Cottonian library, forms a part of this tranſlation. Ottfried's Paraphraſe of the four Goſpels, made about the year 870, affords a proof that alliteration had fallen into diſuſe, and preſents us with the earlieſt ſpecimen of German rhyme.

Nor is this early production unintereſting. The infant Saviour is deſcribed as growing amongſt men as a lily amongſt thorns.

The victory gained in the year 883 over the Normans, by Louis III., was recorded, as is ſtated by a contemporary chronicle, "not only in our annals, but alſo in our national ſongs." The Franks had not yet adopted the language of

their

their vaſſal Gauls; and one of their national ſongs, which has been ſingularly preſerved, is written in the pure Franco-Theotiſc dialect, and conſequently belongs to the hiſtory of German poetry. From theſe ſcanty remains we paſs on to the period (from 1136 to 1254) during which the imperial dignity was held by the houſe of Hohen-Stauffen. Upon the acceſſion of Conrad III., the founder of the Swabian line, the banquet-hall ſuddenly unfolds its portals, and we behold the fathers of romantic verſe, in the perſons of "kings and dukes, mailed knights and truſty ſquires," each of whom

> "—— took the harp in glee and game,
> And made a lay, and gave it name."

Under this new race of rulers, the dialects of the ſouth and weſt of Germany obtained a decided preponderance. The Swabian or Allemannic became blended with the Franco-Theotiſc, and thus formed the baſis of the language of the preſent day; which, as in the parallel inſtance of the "Volgare illuſtre" of Italy, has ſuperſeded its ſiſter idioms, and become the ſole vehicle of information.

Whatever literary impulſe may have been given by the firſt cruſade, it appears that the ſecond produced a more decided effect, by generally diffuſing the cultivation which had been maturing in the more propitious regions of the ſouth. The population of the empire was brought into cloſer connection with the ſongſters of Provence and Catalonia, and their poliſhed ſtrains were ſoon re-echoed in the harſher tones of the "Minne Singers," or bards of love, as they were pleaſed to call themſelves, of the Swabian era. A noble author is now conſidered as a rare occurrence. But in the age of the "Minne Singers," hardly any one dared to cultivate the art of verſification, unleſs he could prove his ſixteen quarters. The ſovereigns of Germany themſelves, emulating perhaps the example of our captive Richard, ſhared in the ſame fervour. The collection in the volume of Rudiger Maniſs is headed by the poems of the emperor Henry; the next place is held by Wenceſlaus, king of Bohemia. A ballad, diſtinguiſhed for its tenderneſs, is given as the production of the duke of Breſlau. The verſe of Henry, duke of Anholt, is by no means devoid of taſte and elegance; and a ſingle lay bears witneſs to the talents of the unfortunate Conradine. The "Geſte" of king Rother connects itſelf both with the Helden-buch and the Cycle of Charlemagne. This poem, and a fragment of the hiſtory of the expeditions of the French monarchs againſt the Saracens, are the earlieſt ſpecimens now extant of the German metrical romance.

The Swabian era produced upwards of two hundred poets, many of whom are deſerving of attention. Under Rodolph of Hapſburg (1273) and his ſucceſſors, they began to loſe ground; and the brilliancy which had diſtinguiſhed the preceding era gradually died away.

It is difficult to eſtabliſh a definite boundary for the different periods of literary hiſtory; they melt into each other, like the colours of the rainbow. In Conrad of Würzburgh, who flouriſhed towards the concluſion of the 13th century, we find the glow of better days united to ſome of the peculiarities of the later "Maſter-Singers" of Augſburg and Nuremburg. At this time a few princes and high-born lords, amongſt whom Otto the marquis of Brandenburg, and the count of Leiningen, may be named as the moſt diſtinguiſhed, ſtill continued to imitate the ſtyle of the Swabian poets. But they had no ſucceſſors. The art expired amongſt the nobility, and the ſcene was ſuddenly changed. Poetry certainly never had ſo ſingular a fortune in any other country as in Germany. It actually became one of the incorporated trades in the German cities; and the burghers obtained the freedom of it, as of any other corporation. By M. Grimm the "Minne-Singers" and the "Maſter-Singers" are ſuppoſed to have originally formed but one claſs of poets. At all events, theſe ſocieties offer a moſt ſingular phenomenon. Compoſed entirely of the lower ranks of ſociety, they obtained a monopoly of verſe-craft, and extended their tuneful fraternity over the greater part of the empire. The candidate for admiſſion into theſe ſocieties was introduced with preſcribed formalities. The four "merkers," or examiners, ſat behind a ſilken curtain, to paſs judgment on his qualifications. One of theſe had Martin Luther's tranſlation of the bible before him, it being conſidered as the ſtandard of the language. His province was to decide whether the diction of the novice was pure, and his grammar accurate. The others attended to the rhyme and metre of the compoſition, and the melody to which it was ſung. And if they united in declaring that the candidate had complied with the ſtatutes and regulations, he was decorated with a ſilver chain and badge, and admitted into the ſociety.

Bouterwick remarks, that the rude inferiority of the German poetry, during the 16th century, forms an unpleaſing contraſt to its ſtate in Italy and Spain. In the age of Arioſto and Cervantes, Hans Sach continued to rank as the firſt German poet; and the only dignified epic which Germany poſſeſſed was the ſtiff allegory of Melchior Pfuitzing.

Having traced the riſe and progreſs of the art of verſification in Germany, we ſhall now ſtill purſue the ſame ſyſtem, in noticing, firſt, thoſe places where its early dawn was unmixed with the rays of neighbouring conſtellations. Sheringham and Bartholine inform us, that the ſcaldi or bards were highly honoured among the Daniſh tribes; that their verſe was of the legiſlative caſt; and that they ſung the great actions of their anceſtors, and kindled the flame of war by the influence of poetic recitation. The "Welkina" and "Niſlunga Saga" were compiled in the 13th century from the ſongs of the Danes and Swedes. We alſo meet with the poetical and muſical office united in almoſt every northern clime. The union of the legiſlator's and bard's character is exemplified in the perſon of Snorro Sturleſon, who, about ſix hundred years ſince, was at once the chief legiſlator and moſt eminent bard in the iſle of Iceland. Odin, the Scythian legiſlator, boaſted that the Runic ſongs had been handed to him by the gods. Strabo tells us, that throughout the whole diſtrict of Gaul, there were three kinds of men held in high eſtimation, the Bards, the Vates, and the Druids. Diodorus Siculus adds, that "the bards ſung to inſtruments, praiſing ſome and ſatyrizing others." The Britiſh bards, about the ſame time, were of the ſame character; and their genius is ſufficiently evinced by their verſe yet extant under the name of Oſſian, if Oſſian's work be genuine. In Ireland they were endowed with eſtates, and lived by public patronage, independent and free from temporal care. Ollamh Fodlah, one of their kings, ſummoned them to a triennial feſtival, for the purpoſe of tranſmitting to poſterity the authentic records contained in their verſe; which were from them ſelected and preſerved in the cuſtody of the king's antiquary. In the year 558, the Iriſh bards, being extremely numerous, and inſolently powerful, had attained the ſummit of their influence. Even in the time of Spenſer, they were the ſubject of ſerious complaint. (Keating's Hiſtory, and Spenſer's View of the State of Ireland.) Nor are we without inſtances of the native and ungrafted ſtate of verſe in the tranſatlantic world. In the ancient empire of Peru, Garcilaſſo de la Vega informs us, that their ſongs were innumerable;

numerable; that he had heard many, and learned fome from his anceftors, who were the laft of the royal family of the Incas. Their Incas or chiefs had been poets or muficians in the early periods of their hiftory. The fame author prefents us with fome fpecimens of their verfe, which bear every character of aboriginal texture. Father Lafitau (Mœurs des Sauvages, tom. ii. p. 213.) has given a circumftantial account of the feftivities of the Iroquois, Hurons, and fome lefs confiderable tribes of North American Indians, in which verfe and fong bore an effential part. Thefe, for the moft part, confift of the fables of ancient times, and are compofed in a ftyle fo antiquated as to differ materially from their colloquial dialect. They were obferved alfo to retrench or ftrike off fome fyllables from their words, to produce the requifite meafure; and the audience beat the time with a correfponding motion of the head, accompanied with fhouts, repeated at certain intervals with fuch accuracy that they never err.

It is eafy to perceive that our remarks have hitherto been confined to trace the earlieft fource and rife of verfification amongft thofe nations only, where we were moft likely to difcover it in a ftate unmixed with borrowed ftreams. The tafk is evidently not a little difficult, to fay exactly where it can be contemplated in a ftage purely nafcent. Its diftant courfe has gradually receded from our view, and ultimately loft itfelf in the remote and vifionary forms of aboriginal tradition. Nor do we mean to affirm that the fubfequent meanders, which, from each infulated fountain, we have for a while been led to purfue, has, in every inftance, remained unblended with the confluence of adventitious channels. It is fufficient if, by the preceding remarks, we have, in any degree, developed thofe features which appear to be uniformly peculiar to its infant ftate. This, however, will not only apologize for, but even warrant, our omitting, until this, to mention the Greek and Roman verfification, where we can contemplate it only in an engrafted predicament. It is admitted, that knowledge and ufeful arts the Greeks received from the Eaft; yet it is the opinion of fome, that fince "the Greeks ftudied no foreign language, it was impoffible that any foreign literature fhould influence their's. Not even the name of a Perfian, Affyrian, Phœnician, or Egyptian poet is alluded to by a Greek writer. The Greek poetry was, therefore, wholly national. The Pelafgic ballads were infenfibly formed into epic, tragic, and lyric poems; but the heroes, the opinions, the cuftoms mentioned in them, are exclufively Grecian; as they had been, when the Hellenic minftrels knew little beyond the Adriatic and the Egean." This argument, however, is not fo conclufive as to lead to the inference, that the Greeks had no preceding example from which to copy. No more can we fuppofe that Homer was the moft ancient poet: for as the Paradife Loft of Milton plainly implies that other epic poems exifted prior to this, and that Milton had read them; fo do the Iliad and Odyffey of Homer. It is contrary to all the phenomena of the human mind, that fo finifhed a work fhould have been the *firft* effay of the kind. There can be no room to doubt but many poets flourifhed before Homer. As the Paradife Loft neceffarily fuppofes Spenfer's Fairy Queen; that, Taffo's Gerufalemme Liberata; that, Virgil's Æneid; and the Æneid, the Iliad of Homer; fo the Iliad itfelf may ftand in reference to as many preceding poems as the Paradife Loft does. As the Æneid never could have exifted, had not the Iliad gone before, after the model of which it is entirely conftructed; and as the Jerufalem Delivered is a proceed from the Æneid, as the Fairy Queen is from the poem of Taffo, and the Paradife Loft from the whole; fo we may conjecture, that the Iliad is from the works of preceding poets, and that we are left to lament the irreparable lofs of a vaft mafs of intellect in the deftruction of the works which preceded and gave birth to thofe of Homer.

In the art of verfification, the Greeks and Romans claim that eminent and diftinguifhed rank, which has already fecured to their memory that renown and celebrity to which they were fo unqueftionably entitled. But as they poffeffed this art only in an engrafted ftate, and as their fuccefs in this department of literature is fo univerfally known, and as we fhall have a future opportunity to notice it, our limits compel us here to pafs to that which is more recondite and lefs generally underftood.

According to the teftimony of the abbé Andres, and the authentic MSS. which he cites, it is to the Arabs that Spain, France and Italy, were not a little indebted for the cultivated ftate of their verfification. Thefe nations had for a long time groaned under the yoke of the barbarians of the North; and according to the teftimony of the abbé Andres, it is chiefly to the inftrumentality of the Arabs that we owe the return of the fciences into Europe. Amongft the French and the Spaniards who have cultivated with the greateft fuccefs the poetry of which the Arabs gave them the example, the Troubadours of Provence, for the harmony of their enchanting verfe, which has been received with fuch eclat through Weftern Europe, ftand pre-eminently diftinguifhed. The hiftory of the Troubadours is replete with the names of thofe exalted perfonages, to whom it had become a delightful recreation to compofe verfe in the Provençal dialect. We may mention, amongft others, William, duke of Aquitania, whofe verfes were compofed in the year 1100 A.D.; Peter I.; Alphonfe I.; James the Conqueror; James I.; Thibaut, king of Navarre; Charles of Anjou, brother of St. Louis, king of Naples and Sicily; Henry, duke of Brabant; Peter Mauclerre, earl of Brittany; Raoul, count of Soiffons. There exifts yet at the Efcurial a code, of which Cafiri (tome i. p. 126.) makes mention, and which notices the literary difpute between Abu-Jahia, fon of the king of Toledo, and Almotemed, king of Cordova, to obtain the poetic prize. Neither muft we omit to mention the name of Frederic II., who patronized the Mufes, and was himfelf a poet. Nor the poems compofed by king Alphonfe X. fon of St. Ferdinand, who fignalized himfelf for the protection he afforded to the Troubadours.

The encouragement which the Provençal poets enjoyed under the aufpices of the great, induced them to traverfe Europe in every direction. They reforted to the caftles and palaces of kings, they were received with tranfport, and their melodious ftrains were liftened to with enthufiaftic plaudits. Nor was England without fome fhare of the general fervour. It was by the aid of the Troubadours, fays Dryden, that Chaucer enriched and polifhed that language, which the fame Dryden calls "fterile." Richard I. was furrounded by the Troubadours and cultivated their verfe. In fhort, fays the fame Andres, every king and emperor accounted it an honour to become accomplifhed in Provençal poetry.

From the intercourfe of the Provençals throughout Italy, their verfe obtained the honour of becoming the mother of Italian poetry. This is afferted by Bembo, Equicola, Varchi, and by many other Italian authors, and efpecially by Baftero (Prefaz alla Crufca Provenzale.) There is no Italian author who has more frankly pronounced his opinion in favour of the Provençals than Bembo. (Prof. I.) He favours us with a long detail of all that the Italians had borrowed from the Provençals. Redi alfo enumerates thofe amongft the Italians, who had blended in their Tufcan compofition, a multitude of words and phrafes peculiar to the Provençals.

The

The celebrated Tiraboſchi, in his Hiſtory of Italian Literature, ſpeaks alſo of the rhyme and the different kinds of poetic compoſition which the Italians had borrowed from the Provençals. On this ſubject may be read the work of Vicenzo Gravina della Ragion Poetica, liv. ii. p. 132, and L'Iſtoria della volgar Poeſia del Creſcimbeni. The three fathers of Italian literature, Dante, Boccaccio and Petrarca, were eminently converſant with this exotic verſe. The laſt lived a long time in Provence, and ſtudied for a while at Paris; and Taſſoni aſſures us, "il Petrarca molto preſe da' rimatori Provenzali." As to Boccaccio, it is generally acknowledged, that in his Decameron, he excels by the riches he has culled alike from the Roman and Provençal poets. But of the three, it is more eſpecially Dante who has clearly decided, that it is Italy which has borrowed from the French, and more particularly from the Troubadours.

It is not without foundation that the count Caylus accuſes the Italians of plagiariſm; and it is not without reaſon that Millot ſays, that the Provençals opened the road to the Italians and furniſhed them with models for imitation.

Nevertheleſs, whatever may be the degree of plagiariſm of which the ancient Italian poets are accuſed; whatever may have been the anteriority of the time in which the belles lettres flouriſhed among the Provençals; and the time when it paſſed to the Italians; we cannot refuſe to the latter the honour of being pre-eminently diſtinguiſhed for the peculiar care they have beſtowed on the ſuperſtructure, and for their advancing to the acmé of cultivation thoſe arts and ſciences which had been ſepulchred under the ruins of the Roman empire. The Arabs, the Spaniards, the French, the Engliſh, and all other nations, ſays Andres (tome i. c. 12. p. 339. edit. de Parme), have been as the Egyptians and the Aſiatics who claim the right of originality in the invention and culture of their verſe; but the Italians may be regarded as the Greeks, who with the induſtrious bee culled their honey from every ſurrounding flower.

We muſt not forget, however, that with regard to this right of priority, the Provençals have formidable rivals in the Sicilians. The authorities on each ſide of the queſtion ſeem paradoxically equal. Sicily has always boaſted herſelf to have been the cradle of Italian poetry. She encircles herſelf with a cloud of authorities, which ſerve as a ſhield to protect her from the deſign to rob her of that title of which ſhe deſires the excluſive enjoyment. To this end, ſhe frequently offers to conſideration the following paſſage of Dante. (Volg. Eloq.) "Ex acceratis, quodammodò, vulgaribus Italis, inter ea quæ remanſerunt in cribro comparationem facientes honorabiliùs ac honorificentiùs, breviter ſeligimus: et primò de Siciliano examinemus ingenium: nam videtur Sicilianum vulgarem ſibi famam præ aliis adſciſcere, eò quòd quidquid poetantur Itali Sicilianum vocatur."

Petrarch, who in the next age ſucceeded Dante, both in his proſe and poetic works, confirms the ſame opinion. Nor does he expreſs himſelf with leſs deciſion in the epiſtle which he compoſed about the year 1360.

Petrarch alſo informs us, that in his poems, he had followed that ſpecies of verſification, which had made its reappearance ſome ages before in Sicily, or at leaſt two or three hundred years before the twelfth century.

But to afford the cleareſt light in the diſcuſſion of this ſubject, it is neceſſary to tranſport our ideas to the period of the decline of the Roman empire. The Italian language took its radical elements from the nature of the Latin. Even before the ſplendour and the authority of the emperors had been impaired, the language was adulterated by that admixture of barbariſms which ſeemed the neceſſary conſequence of foreign intercourſe. But all limits to this corruption were overthrown, when the Goths, the Huns, the Greeks, the Lombards, the Franks and Germans in rapid ſucceſſion inundated the empire. Hence aroſe a new jargon which ſerved the vulgar and the plebeian tribes in their colloquial intercourſe, whilſt the learned and the polite circles of ſociety endeavoured to maintain the dignity and purity of the Latin language. The former, however, compoſed the majority, and carried the day. This, according to Muratori, happened about the 11th century.

But whilſt this revolution happened in Italy, France and Spain, where the Latin language, the common genus, branched into three kindred ſpecies, each receiving ſuch modifications as were ſuited to the circumſtances and temper peculiar to each nation, Sicily had alſo been long ſubject to a ſimilar revolution by the frequent invaſions of the Saracens from the year 649 to 827; and again to 1060. And beſides this, the Latin language had been already corrupted by the influence of the Vandals, who made a deſcent on this iſle in 440, and by the dominion of the Goths, who governed it from 493 to 535, when Beliſarius reſcued the iſland. The Sicilians had alſo their plebeian dialect; and they had, from the dominion of the Arabs, imbibed a predilection for that peculiar ſpecies of verſification, which the latter had been equally ſucceſsful in communicating to the Spaniards. The Sicilians, guided by that delicacy of the ear for which they are always remarkable, diſcovered themſelves to be the firſt that had in their native language a certain melodious order, reſulting not from that proſodial quantity which defines merely ſyllables to be long or ſhort, but rather from another meaſure, which is the effect of the acute accent, artificially diſtributed within the limits of a definite number of ſyllables. They were thus enabled, without any other effort, to imitate the taſte and the verſification of the Arabs their conquerors; and the example of the latter was a *ſpark* to ſet on fire what till this was but latent in their imagination, and thus the genius and natural diſpoſition of their minds received an unexpected and brilliant developement.

It is, at leaſt, affirmed, that the Sicilians have far exceeded the Spaniards and the French in the culture of this modern verſification. And Caſtelvetro and Muratori maintain, that it was not Italy and Sicily that received from the Provençals the elements of this new ſpecies of verſe, but that the latter were indebted for it to the Sicilians. We learn, however, from the authority of inconteſtible witneſſes, that the Sicilians made great progreſs in the culture of the fine arts either during the 9th or 10th century; whilſt Fauchet could not find among the poetry of the French a writer more ancient than Euſtaché, who flouriſhed about the middle of the 12th century. And Galland (Acc. Inſcr. tom. iii.) could not quote an author anterior to the ſame. And whilſt the learned Andrews could not fix the birth of the ſame art amongſt the Spaniards earlier than the 11th century.

The Sicilian verſification, at firſt rude, uncultivated, and barbarous, became, by degrees, a ſtudied and poliſhed art, replete with brilliant images, and with thoughts noble and ſublime. It was, in ſhort, the verſe of the year 1220 that was ſeen to ſhine with peculiar luſtre in the mind of Frederic II., who, after he had received the inveſtiture from pope Celeſtin, came to reign in Sicily. The Sicilians preſerve even yet his poems, thoſe of Euzo his ſon, king of Sardinia, and thoſe of Pier delle Vigne, ſecretary to the ſame. From the centre of Sicily, this art diſſeminated itſelf over all Italy. The more learned Italians, attracted by the virtues of a generous prince, came in a crowd to Sicily, frequented the court of Frederic, became themſelves poets, and carried the taſte of the novel verſification into their native country.

Creſ-

Creſcimbeni dates the commencement of this art about the year 1189. But Quadrio fixes its origin about the year 1135. And this he proves by an inſcription in verſe, which he found in the cathedral church of Ferrara.

It is not improbable, however, that when Frederic II. arrived in Sicily, which happened nearly a century after this, he was already well inſtructed in this new ſpecies of verſification, which he had learned in Provençe, his native country; and alſo that he poſſeſſed an art which he had derived from the Arabs eſtabliſhed in Spain, whilſt the Sicilians boaſted the poſſeſſion of the ſame art, which they had originally received from the Saracens.

Theſe two points of hiſtory being reduced to theſe parallel terms, it will become eaſy to reſolve what would otherwiſe appear to be contradictory and paradoxical in thoſe apparently oppoſite opinions, of which the one attributes to the Sicilians, the other to the Provençals, the honour of having been the firſt who communicated to Italy the knowledge of this modern ſpecies of verſification. The fact doubtleſs is, that both the one and the other, nearly at the ſame time, received from the Arabs that new acquiſition for which their own dialects were found to poſſeſs a certain innate congeniality, and ſubſequently became reciprocally inſtrumental in confirming and maturing that art, which ſoon became celebrated throughout Europe, under either the Italian epithet "lettere amene e leggiadre," or the Provençal "guai ſaber," *i. e.* the *gay ſcience*.

Having now, perhaps, executed the moſt difficult part of our taſk, in tracing from this remote and obſcure period, the earlieſt ſource of this new ſpecies of verſification, our limits and our readers will exempt us from entering into a long detail of the ſubſequent progreſs of this art amongſt two neighbouring nations, eſpecially as this part of the ſubject is more acceſſible through the medium of the pens of the literati of France and Italy.

Before we proceed to treat on the nature of verſe, it will be neceſſary to premiſe the following explanations of ſuch technical terms as will occur in the ſequel.

A Syllable.

By a reference to the article Quantity, the reader will diſcover that we have already had an opportunity of diſtinguiſhing between a ſhort and a long ſyllable, and of ſtating that the former is uſually denoted by a ſmall curve, as ˘; and the latter by a daſh, as ¯

Feet.

A *foot*, (ſo called from the ancient cuſtom of beating time by the foot,) is a part of a verſe, and conſiſts of two or more ſyllables, as here exemplified.

I. Twelve Simple Feet.

1. *Four feet of two ſyllables.*

1	A ſpondee	¯ ¯
2	A pyrric	˘ ˘
3	A trochee, or choree	¯ ˘
4	An iambus	˘ ¯

2. *Eight feet of three ſyllables.*

5	A moloſſus	¯ ¯ ¯
6	A tribrac	˘ ˘ ˘
7	A dactyl	¯ ˘ ˘
8	An anapæſt	˘ ˘ ¯
9	A bacchic	˘ ¯ ¯
10	An antibacchic	¯ ¯ ˘
11	A cretic, or amphimacer	¯ ˘ ¯
12	An amphibrac	˘ ¯ ˘

II. Eighteen Compound Feet.

"Quidquid enim ſupra tres ſyllabas habet, id ex pluribus eſt pedibus." Quintil. 9. 4.

1. *Four of the ſame foot doubled.*

13	A diſpondee, or two ſpondees	¯ ¯ ¯ ¯
14	A proceleuſmatic, or two pyrrics	˘ ˘ ˘ ˘
15	A dichoree, or two chorees, or trochees	¯ ˘ ¯ ˘
16	Adiïambus, or two iambuſes	˘ ¯ ˘ ¯

2. *Four of contrary feet.*

17	A great ionic, or a ſpondee and a pyrric	¯ ¯ ˘ ˘
18	A ſmall ionic, or a pyrric and a ſpondee	˘ ˘ ¯ ¯
19	A choriambus, or a choree and iambus	¯ ˘ ˘ ¯
20	An antiſpaſt, or an iambus and a choree	˘ ¯ ¯ ˘

3. *Four feet in which long times exceed*

21	Firſt epitrit, or an iambus and ſpondee	˘ ¯ ¯ ¯
22	Second epitrit, or a choree and ſpondee	¯ ˘ ¯ ¯
23	Third epitrit, or a ſpondee and iambus	¯ ¯ ˘ ¯
24	Fourth epitrit, or a ſpondee and choree	¯ ¯ ¯ ˘

4. *Four feet in which ſhort times exceed*

25	Firſt pæon, a choree and pyrric	¯ ˘ ˘ ˘
26	Second pæon, an iambus and pyrric	˘ ¯ ˘ ˘
27	Third pæon, a pyrric and choree	˘ ˘ ¯ ˘
28	Fourth pæon, a pyrric and iambus	˘ ˘ ˘ ¯

5. *Compound feet of five ſyllables.*

29	Dochmius, an iambus and cretic	˘ ¯ ¯ ˘ ¯
30	Meſomacer, a pyrric and a dactyl	˘ ˘ ¯ ˘ ˘

Metre

A *metre* is compoſed of two adjacent feet. In Greek verſe of the dactylic ſpecies, one foot conſtitutes a metre, according to Hephæſtion;

"Κατα Μονοποδιαν μετρειται τα Δακτυλικα."

In Greek verſe of double feet, a metre is alſo ſaid to conſiſt of only one foot; but ſince, in this caſe, each foot compriſes two ſimple feet, it forms no exception to the general rule. Metre is divided into nine ſpecies; *iambic, trochaic, anapæſtic, dactylic, choriambic, antiſpaſtic, ionic à majore, ionic à minore, pæonic.*

Rhythm

Is a ſeries of ſimilar feet, continued until the ear perceives the order of the ſeries, and is able to anticipate the peculiar nature of the verſe. To render this more plain, we add, that rhythm in verſe is analogous to as many terms of an infinite ſeries in mathematics, as are neceſſary to render the law of the riſing order apparent, and from which we can eaſily anticipate the ſequel; or, more exactly, if we have the compound circulate $\cdot\dot{3}2\dot{5}$ given to evolve the ſeries, we eaſily write or repeat $\cdot 325 \mid 325 \mid \dot{3}2\dot{5}$, &c. to as many periods as neceſſary.

Now, a metre is ſaid to be the *commencement* of this ſeries. A rhythm is that portion of the ſeries, which brings the whole under the recognizance of the ear. Metre reſpects both the *time* and *order* of the ſyllables. The rhythm of a dactylic and anapæſtic meaſure is the ſame; the metre different.

Verse.

A *verſe* is an aſſemblage of a definite number of feet, and contains one, two, or more metres; and is accordingly termed

termed either a *monometer*, *dimeter*, *trimeter*, *tetrameter*, *pentameter*, or *hexameter*, &c. Verse sometimes receives its name from a reference to the number of feet, not of metre, which composes it; as, the *senarius*, *octonarius*, *novenarius*, &c: sometimes from a noted author who was particularly attached to that species; as, *Sapphic*, *Anacreontic*, *Alcaic*, *Hipponactic*.

A verse is also said to be *acatalectic*, if it be neither defective nor redundant; *catalectic*, if it want a *final* syllable; *brachycatalectic*, if it want two; *hypercatalectic* or *hypermeter*, if it exceed the regular measure; *acephalous*, if it want an *initial* syllable.

Hence the *complete* name of a verse necessarily consists of *three* terms; the first referring to the *species*, the second to the *number* of metres, the third to the apothesis or *ending*. See VERSE.

Schmidius and Triclinius, in their Analysis of the Metres of Pindar and Sophocles, generally recite first the general name, consisting of the three terms above-mentioned, and then subjoin the particular feet.

A *hemistich* is, properly speaking, a half verse: yet the name is commonly applied to either portion of an hexameter verse divided at the penthemimer.

The *triemimeris* is that portion of a verse (measured from the beginning of the line) which contains three half feet, or a foot and a half; *penthemimeris*, five half feet, or two feet and a half; *hepthemimeris*, seven half feet, or three feet and a half; *ennemimeris*, nine half feet, or four feet and a half.

A *distich* is a couplet of two verses.

A *stanza*, or *strophé*, is such a series of two or more verses of different kinds, as comprises every variety employed in the composition.

When only one sort of verse is used throughout the ode or poem, such an ode, &c. is called *monocolos;* when several sorts, *polycolos:* or more precisely, if there are two sorts of verse in a poem, it is called *dicolos;* if three, *tricolos;* if four, *tetracolos*.

When the stanza, or strophe, is composed of two verses, it denominates the ode *distrophos;* when of three, *tristrophos;* when of four, *tetrastrophos*, &c.

By a complex use of these terms, the ode is *dicolos distrophos*, when in a stanza there are two verses of different kinds; it is *dicolos tristrophos*, when the stanza contains three verses, but only of two kinds, one sort being twice used; *dicolos tetrastrophos*, when the stanza has four verses, but of only two sorts, one sort being used thrice. Again, the ode is *tricolos tristrophos*, when the stanza consists of three verses, each of a different kind; and *tricolos tetrastrophos*, when in the stanza there are four verses, but of only three kinds, one being used twice.

Hebrew Versification.

On the very first attempt to elucidate the nature of this versification, a question presents itself uncommonly difficult and obscure. If it be essential to the existence of verse that it be measured by a definite number of feet or syllables, it appears absolutely necessary to demonstrate that those parts at least of the Hebrew writings which we term poetic are in a metrical form, and to inquire whether any thing be certainly known concerning the nature and principles of this versification or not.

It is well known, that an hypothesis was invented by bishop Hare concerning the Hebrew metres; and the arguments which he had advanced in its favour appeared so conclusive to some persons of great erudition, as to persuade them, that the learned prelate had fortunately retrieved the knowledge of Hebrew verse, after an oblivion of more than two thousand years. The following are the rules or canons of bishop Hare.

1. In Hebrew verse all the feet are dissyllabic.
2. No regard is paid to the quantity of the syllables.
3. When the number of the syllables is even, the verse is trochaic, placing the accent on the first syllable.
4. If the number of the syllables is odd, the verse is iambic, and the accent is to be placed on the second syllable.
5. The periods mostly consist of two verses, often three or four, and sometimes more.
6. The verses of the same period, with few exceptions, are of the same kind.
7. The trochaic verses mostly agree in the number of feet; there are, however, a few exceptions.
8. In the iambic verses the number of feet are mostly unequal, though in some instances they are equal.
9. Each verse does not contain a distinct sense.

One of the examples given by bishop Hare for the illustration of these rules, is the 111th Psalm, which the learned reader may consult in any pointed Hebrew bible.

The same example is alluded to by bishop Lowth, in the following confutation of the principles of bishop Hare.

1. In the first place, the feet are not all dissyllables.
2. Attention must always be paid to the quantity of the syllables, for the same word, as often as it occurs, is always of the same quantity.
3. The verses are either trochaic which admit a dactyl, or iambic which admit an anapæst. But it by no means follows, that a verse is either the one or the other, from its consisting of an even or odd number of syllables. Those, indeed, which consist of an even number of syllables, are, for the most part, iambic; but they are also sometimes trochaic. And those which consist of an odd number of syllables are mostly trochaic; but they are, however, sometimes iambic, contrary to the third and fourth canons.
4. The verses of the same period are of different kinds, a few only excepted; and those which are of the same kind seldom agree in the number of syllables and feet; and these facts are contrary to the sixth, seventh, and eighth canons.
5. All the periods consist of only two verses: this is contrary to the fifth canon.
6. Each verse has one particular sense; contrary to the ninth canon.

And in the same manner, perhaps, may every hypothesis, which pretends to state the laws of Hebrew verse, and to prescribe the numbers, the feet, the scanning of the lines, be confuted. For to that hypothesis another directly contrary, yet confirmed by arguments equally forcible, may be successfully opposed.

Subsequently to bishop Hare, John Robertson, M.D. published his treatise on the Hebrew versification. To give any idea of his method, it is requisite to premise, that he, in common with the antimasoretics, supplies the pointed vowel by *ɛ*; to ו he gives the power of U or V, and to ע, O. His rules are as follow:

"1. Every syllable is long in which there is a written vowel. 'Tis true that I and U are sometimes joined in one syllable with the vowel *before*, but *oftener* with that *after* either of them. But in that case the I and U are not vowels, but consonants.

"2. Every syllable having the inserted or implied vowel *ɛ* is short, if only one consonant follows it before another expressed or implied vowel occurs.

"3. Every syllable having only an inserted vowel in it is long, if two or more consonants intervene between it and the next expressed or implied vowel, either in the same or following word.

"4. In

" 4. In all Hebrew verſes, every alternate ſyllable muſt be long; the others may be long or ſhort.

" 5. The laſt ſyllable of every verſe is common; *i. e.* either long or ſhort."

On laying down theſe preliminaries, it was eaſy for Dr. Robertſon to reduce Hebrew verſe to the iambic or trochaic metre. But ſo long as the true Hebrew pronunciation and the quantity of their vowels remain unknown, to attempt the analyſis of Hebrew verſe by iambic, trochaic, anapæſtic, or any other metre, is to lay a ſuperſtructure without a foundation. But whilſt we prefer to proſecute the ſequel rather with biſhop Lowth; we do not in the mean time withhold from our readers the pleaſure of peruſing Dr. J. Robertſon's " Treatiſe on the true and ancient Manner of Reading Hebrew, and on Hebrew Verſification," Lond. 1757.

As to the real quantity, the metre and rhythm, theſe from the preſent ſtate of the language ſeem to be altogether unknown; which is the neceſſary conſequence of our uncertainty of the ancient pronunciation. To ſome of thoſe, indeed, who have laboured in this matter, thus much of merit is to be allowed, that they have rendered the Hebrew metre, which, without their methods, ſounded uncommonly harſh, in ſome degree poliſhed and more agreeable. They indeed have furniſhed it with a ſort of verſification and metrical arrangement, when baffled in their attempts to diſcover the real. That we are warranted in attributing to them any thing more than this, is neither apparent from the nature of the thing, nor from the arguments with which they attempt to defend their conjectures.

It is, however, undeniably apparent, that certain of the Hebrew writings bear not only evident ſigns of poetic animation, but alſo ſuch characteriſtics of verſe, as leave us little difficulty in pronouncing them of the poetic claſs. There exiſted, amongſt the Hebrews, a kind of verſe, intended, perhaps, for the memory; in which, when there was little connexion between the ſentiments, an alphabetic order was preſerved by the initial letters of each verſe or ſtanza. Of this there are ſeveral examples, where the verſes are ſo exactly marked and defined, that it is impoſſible to miſtake them for proſe, eſpecially if we compare the correſponding parts of the proximate verſes, where word anſwers to word, and almoſt ſyllable to ſyllable. This being the caſe, though no appeal can be made to the ear, yet the eye remains competent to perceive the poetic ſymmetry and arrangement.

Hebrew verſification alſo exhibits another property peculiar to metrical compoſition. Writers confined to the limits of verſe, are generally indulged with the licence of uſing words in a ſenſe and manner remote from their common acceptation, and of retrenching or adding a ſyllable for the purpoſe of reducing the line to their aſſigned limits. Next to the Greeks, none, perhaps, have admitted thoſe liberties more freely than the Hebrews, and eſpecially by the uſe of certain particles peculiar to metrical compoſition, ſo as to form to themſelves a dialect diſtinctly poetical. There may be further obſerved a certain conformation of the ſentences, ſo that a complete ſenſe is almoſt equally infuſed into every component part, and every member conſtitutes an entire verſe. So that as the poems divide themſelves in a manner ſpontaneouſly into periods, for the moſt part equal, ſo the periods themſelves are divided into verſes, moſt commonly couplets, though frequently of greater length. The Hebrew verſe too was adapted to their cuſtom of ſinging correſponding parts by alternate and oppoſite choirs. (See Nehem. xii. 24. 31. 38. 40. and the title of the 88th Pſalm.) Verſe conſtructed in this manner, is ſimilar to the Grecian proaſm or epode. And it was thus, it is thought, that Moſes with the Iſraelites chanted the ode at the Red ſea. (Exod. xv.) For " Miriam the propheteſs, the ſiſter of Aaron, took a timbrel in her hand; and all the women went out after her, with timbrels and with dances. And Miriam anſwered them, ſing ye to the Lord, for he hath triumphed glorioully: the horſe and his rider hath he thrown into the ſea." (Exod. xv. 20, 21.) On ſome occaſions, one of the choirs ſung a ſingle verſe to the other, which was anſwered by the other by a verſe in ſome reſpect correſpondent to the former.

The 135th Pſalm is obviouſly adapted to *three* choirs; the high prieſt with the houſe of Aaron conſtituting the *firſt;* the Levites, the *ſecond;* and the congregation, the *third;* each having its diſtinct part, and all at ſtated intervals uniting in full chorus.

From an analyſis of this pſalm it might eaſily be ſhewn, that the Hebrew hymn is a compoſition not leſs regular than the Grecian ode. One cannot but obſerve too, that it was from the Jewiſh, that the Chriſtian church derived the cuſtom of ſinging in alternate chorus. Pliny (l. x. epiſt. 97.) obſerves of the primitive Chriſtians, that " they repeat alternate verſes to Chriſt as to a god." And the remains of this ancient cuſtom are yet evident in the alternate or reſponſive parts of the liturgy of the eſtabliſhed church. See Bingham's Antiq. xiv. 1.

The peculiar conformation, already alluded to, in the ſtructure of Hebrew verſe, conſiſts chiefly in a certain equality, reſemblance, or paralleliſm between the members of each period; ſo that in two verſes, or members of the ſame period, things for the moſt part ſhall anſwer to things, and words to words, as if fitted to each other by a kind of rule or meaſure. This paralleliſm conſiſts of three ſpecies. See PARALLELISM.

Greek Verſification.

It is neceſſary, before we preſent the reader with a ſyſtem of the Greek verſification, to apprize him, that the ſecond, fourth, and ſixth foot, &c. of a verſe are commonly called the *even* places; and the firſt, third, and fifth foot, &c. the *odd* places.

I. *Iambic Metre.*

1. An iambic verſe admits in the even places an iambus, in the odd, an iambus or a ſpondee.

2. An iambus in the odd places may be reſolved into a tribrach; the ſpondee, into a dactyl or anapæſt.

3. An iambus in the even places (except the laſt) may be reſolved into a tribrach. An anapæſt is ſubſtituted for it in the caſe of a proper name only.

4. A dactyl muſt be avoided in the fifth place; and reſolved feet muſt not concur.

Dimeters catalectic.

Ουθ' αιρει με χρυσος,
Ουδε φθονω τυραννοις.
Εμοι μελει μυροισι
Καταβρεχειν υπηνην·
Εμοι μελει ροδοισι
Καταστεφειν καρηνα.

Beginning with an anapæſt.

Απολοιτο πρωτος αυτος
Ο τον αργυρον φιλησας.
Δια τουτον ουκ αδελφος,
Δια τουτον οι τοκηες.—Anacreon.

Trimeters

Trimeters or ſenarii.

Εν παντι πραγει δ' ανθ' ὁμιλιας κακης
Κακιον ουδεν, καρπος ου κομιστεος.
Ατης αρουρα θανατον εκκαρπιζεται
Η γαρ ξυνεισβας πλοιον ευσεβης ανηρ
Ναυταισι θερμοις και πανουργια τινι,
Ολωλεν ανδρων συν θεοπτυστῳ γενει·—Æſchylus.

II. *Trochaic Metre.*

1. A trochaic verſe admits trochees in the odd places, trochees and ſpondees in the even places.

2. The trochee may in any place be reſolved into a tribrach; and the ſpondee into a dactyl or anapæſt.

3. A dactyl in the odd places occurs only in the caſe of a proper name.

4. In trochaic tetrameters, the ſecond metre ſhould always end with a word.

Dimeters catalectic.

Ταυτα τις ταχ' αν πατηρ
Η τεκουσα νεοπαθη;
Οικτον οικτισαιτ'. επει-
-δη πιτνει δομος Δικας.—Æſchylus.

Tetrameters catalectic.

Ου γαρ αν ξυμβαιμεν αλλως, ἢ 'πι τοις ειρημενοις,
Ωστε με σκηπτρων κρατουντα, τησδ' ανακτ' ειναι χθονος.
Των μακρων δ' απαλλαγεισα νουθετηματων μ' εα.
Και συ τονδ' εξω κομιζω τειχεων, η κατθανε.

III. *Anapæſtic Metre.*

1. An anapæſtic admits either in the even or odd places an anapæſt, a ſpondee, or a dactyl.

2. Except the dimeter catalectic, called paræmiacus, which requires an anapæſt only in the laſt place but one.

3. Anapæſtic verſes are ſometimes intermixed with other ſpecies.

4. A ſyſtem is chiefly compoſed of dimeters, and is moſt correct when, firſt, each foot, or at leaſt each ſyzygy, ends with a word: ſecondly, when the laſt verſe but one, is monometer acatalectic; and the laſt, dimeter catalectic; with an anapæſt in the ſecond metre.

5. In a ſyſtem, the laſt ſyllable of each verſe is not (as in other ſpecies) common; but has its quantity regulated by the foot of which it is a part.

6. The monometer acatalectic is termed an anapæſtic baſe. This, in a ſyſtem, is ſometimes diſpenſed with. In the paræmiacus rarely.

7. A ſeries of anapæſtic verſes, conſiſting of one or more ſentences, muſt be conſtructed as if each ſentence were only a ſingle verſe. Therefore, if the laſt foot of a verſe, in the middle of a ſentence, begin as an anapæſt or ſpondee, its laſt ſyllable muſt be long; but as a dactyl, ſhort. This rule, however, may be diſpenſed with, when a tribrach, cretic, or trochee, ſupplies the place of an anapæſt, dactyl, or ſpondee.

8. An anapæſtic verſe has ſometimes in the laſt place a proceleuſmatic, which foot is iſochronal to an anapæſt; as,

Προς εμον ο | μογινιτο | ρα.—Eur. Ph. 169.

Anapæſtic ſyſtem with the baſe.

Δηλον εμοι γ' ως Φορβης χρεια
Στιβον ογμευει τονδε πελας που.
Ταυτην γαρ εχειν βιοτης αυτον
Λογος εστι φυσιν, θηρσιβολουντα
Πτηνοις ιοις στυγερον στυγερως.
Ουδε τιν' αυτῳ
Παιωνα κακων επινωμαν.

Anapæſtic ſyſtem without the baſe.

Ω δεινον ιδειν παθος ανθρωποις,
Ω δεινοτατον παντων ὁσ' εγω
Προσεκυρσ' ηδη. Τις σ' ω τλημον,
Προσεβη μανια; τις ὁ πηδησας
Δαιμων μειζονα των μηκιστων
Προς τη ση δυσδαιμονι μοιρα;
Φευ, φευ, δυσταν'. αλλ' ουδ' εσιδειν
Δυναμαι σε, θελων πολλ' ανερεσθαι,
Πολλα πυθεσθαι, πολλα δ' αθρησαι.
Τοιαν φρικην παρεχεις μοι.—Sophocles.

Syſtem of paræmiaci.

Σιγαν νυν απας εχε σιγαν·
Και παντα λογον ταχα πευσῃ·
Ημιν δ' Ιθακη πατρις εστι.
Πλεομεν δ' αμ' Οδυσσει θειῳ.—Cratin.

Tetrameters catalectic.

Οινου τ' απεχει και γυμνασιων και των αλλων ανοητων,
Και βελτιστον. τουτο νομιζεις, ὁπερ εικος δεξιον ανδρα,
Νικαν πραττων και βουλευων και τη γλωττη πολεμιζων.
Ariſtoph.

IV. *Dactylic Metre.*

1. A dactylic verſe conſiſts only of dactyls and ſpondees.

2. The common heroic is hexameter acatalectic, having in the fifth place a dactyl, in the laſt, a ſpondee.

3. In the heroic verſe, ſeveral licences are allowed, which are not admitted in iambic metre; as, firſt, the lengthening a ſhort final ſyllable not only at the place of the cæſural pauſe, but ſometimes even on other final ſyllables, whoſe emphaſis is increaſed by their beginning a foot; as,

Τοξ' ωμοισιν εχων αμφηρεφεα τε φαρετρην.—Il. ά 45.

Secondly, the hiatus, or the concurrence of two vowels in contiguous words; as when the word ends with a ſhort vowel, Αλλ' ακεουσα καθησο, εμῳ δ' επιπειθεο μυθῳ. Il. ά 565. Or when the word ends with a long vowel or diphthong, in which caſes the ſyllable may either be long without eliſion, or ſhort, on the ſuppoſition that the latter of the component vowels is cut off; as,

Κουριδιης αλοχου, επει ου εθεν εστι χερειων
Ουκ εθελον δεξασθαι· επει πολυ βουλομαι αυτην.

4. The Ionic dialect affords great variety in the form of epic verſes. And that irregular ſort of dactylics, called æolics, admits in the firſt place any foot of two ſyllables: the reſt muſt be all dactyls, except when the verſe is catalectic, and then the catalectic part muſt be a trochee.

5. Hephæſtion terms that ſpecies of dactylics, logaœdics, which requires at the end a trochaic ſyzygy; but every where elſe a dactyl.

Dactylic trimeters.

Αι Μουσαι τον Ερωτα
Δησασαι στεφανοισι,
Τῳ Καλλει παρεδωκαν
Και νυν ἡ Κυθερεια
Ζητει, λυτρα φερουσα,
Λυσασθαι τον Ερωτα.—Anacr.

Dactylic hexameters.

Εν δ' επεσ', ὡς ὁτε κυμα θοῃ εν νηϊ πεσῃσι
Λαβρον ὑπαι νεφεων, ανεμοτρεφες· ἡ δε τε πασα
Αχνῃ υπεκρυφθη, ανεμοιο δε δεινος αητης
Ιστιῳ εμβρεμεται. τρομεουσι δε τε φρενα ναυται
Δειδιοτες τυτθον γαρ ὑπ' εκ θανατοιο φερονται.—Hom.

Elegiac.

Πεπνυσο, μηδ' αισχροισιν εφ' εργμασι μηδ' αδικοισι
Τιμας μηδ' αρετας ἑλκεο, μηδ' αφενος.
Ταυτα μεν οὑτως ισθι· κακοισι δε μη προσομιλει
Ανδρασιν, αλλ' αιει των αγαθων εχεο.—Theogn.

V. *Choriambic Metre.*

1. A choriambic verſe requires in every place but the laſt a choriambus, and in the laſt, an iambic ſyzygy, entire or catalectic.

2. Sometimes the iambic ſyzygy occurs in the firſt place, and in long verſes in other places; but this happens leſs frequently.

3. Either two iambic feet, or a ſpondee and iambus, or the third epitrite, form the iambic ſyzygy: it is uſed here for the former caſe.

4. Any other foot of four ſyllables joined with a choriambic conſtitute the epichoriambic verſe.

Dimeter catalectic.

Ουκ ετος, ω γυναικες,
Πασι κακοισιν ἡμας
Φλωσιν εκαστοτ' ανδρες.
Δεινα γαρ εργα δρασαι
Λαμβανομισθ' ὑπ' αυτων.—Ariſtoph.

Sapphic ſyſtem; conſiſting of epichoriambic and Adonic verſes.

Ποικιλοφρον' αθανατ' Αφροδιτα,
Παι Διος δολοπλοκε, λισσομαι σε,
Μη μ' ασαισι, μηδ' ανιαισι δαμνα
Ποτνια θυμον—
—Ελθε μοι και νυν, χαλεπᾶν δε λυσον
Εκ μεριμνᾶν οσσα δε μοι τελεσσαι
Θυμος ιμειρει τελεσον, συ δ' αυτα
Συμμαχος εσσο.

VI. *Antiſpaſtic Metre.*

An antiſpaſtic verſe admits in the laſt place, an iambic ſyzygy complete, or catalectic, or an incomplete antiſpaſtus; and in the firſt place, beſides the *proper* foot, is admitted any foot of four ſyllables ending like an antiſpaſtus in the two laſt ſyllables; *i. e.* either ˘ ¯ ¯ ¯, ¯ ¯ ¯ ˘, ˘ ˘ ¯ ˘, ¯ ˘ ¯ ˘. But in the intermediate places only an antiſpaſtic.

The following are the moſt uſual varieties in this ſpecies of verſe.

1. In ſhort verſes, the proper foot frequently vaniſhes, and the verſe is compoſed of one of the above-mentioned feet, and an iambic ſyzygy.

2. Every epitrite, except the ſecond, is occaſionally ſubſtituted in the different places of the verſe, eſpecially the fourth epitrite in the ſecond place.

3. If an antiſpaſtic begins the verſe and three ſyllables of any kind remain, the verſe is antiſpaſtic; becauſe the remaining ſyllables may be conſidered as a portion of ſome of the admiſſible or reſolved feet.

4. Long verſes ſometimes contain an iambic ſyzygy in the ſecond place, and then the *third* place admits the ſame varieties as the *firſt*.

Dimeter acatalectic and hyperacatalectic.

Μη φυναι τον απαντα νι-
-κᾳ λογον· το δ' επει φανη,
Βηναι κειθεν ὁθεν περ ἡκει,
Πολυ δευτερον, ως ταχιστα.
Ως ευτ' αν το νεον παρη,
Κουφας αφροσυνας φερον,
Τις πλαγχθη πολυμοχθος εξω;
Οστις του πλεονος μερους
Χρῃζει του μετριου παρεις
Ζωειν, σκαιοσυναν φυλασσων
Εν εμοι καταδηλος εσται.—Soph.

VII. *Ionic Metre à Majore.*

An Ionic verſe à majore admits a trochaic ſyzygy promiſcuouſly with its proper foot.

Var. 1. The ſecond pæon is ſometimes found in the firſt place.

2. A moloſſus in an *even* intermediate place, followed by a trochaic ſyzygy.

3. The ſecond pæon is ſometimes joined to a ſecond or third epitrite, ſo that the two feet together are equal in time to two Ionic feet. This is called an Ανακλασις, the defect in time of the preceding foot being ſupplied by the redundant time of the ſubſequent. And the verſe ſo diſpoſed is called Ανακλωμενος.

4. Reſolutions of the long ſyllables are allowed in all poſſible varieties.

If the three remaining pæons, or the ſecond pæon in any place but the firſt, without an ανακλασις; or if an iambic ſyzygy, or a third epitrite, a choriambus, or any of the diſcordant feet of four ſyllables, be found in the ſame verſe with an Ionic foot, the verſe is then called Epionic.

Trimeters brachycatalectic.

Πληρης μεν εφαινετ' α σελαννα,
Αιδ' ως περι βωμον εσταθησαν.—Sapph.

Tetrameters brachycatalectic.

Σωκρατην ὁ κοσμος πιπονηκε σοφον ειναι,
Και κακως απειλεν τον Σωκρατην ὁ κοσμος,
Εν τῃ φυλακῃ, κωνειον οτι πιων τεθνηκε.—Sotad.

VIII. *Ionic Metre à Minore.*

1. An Ionic verſe à minore is often compoſed entirely of its proper feet. It begins ſometimes with the third pæon, followed by one of the epitrites, for an ανακλασις. And it admits an iambic ſyzygy promiſcuouſly.

2. In the odd places, a moloſſus preceded by an iambic ſyzygy ſometimes occurs: and in the firſt a moloſſus alone.

3. In the intermediate places, a ſecond or third pæon is prefixed to a ſecond epitrite, and this conſtruction is alſo called ανακλασις.

4. The long ſyllables admit of reſolutions, as in the other Ionic metre.

5. An epionic verſe à minore is formed by intermixing with the Ionic foot a double trochee, ſecond epitrite, or pæon without an ανακλασις.

6. When a choriambus precedes or follows an Ionic foot of *either* kind, the verſe is called proſodiacus: which name is applied to a verſe conſiſting of an alternate mixture of choriambic and Ionic feet, or of their reſpective repreſentatives.

7. The two ſpecies of Ionic feet are not to be intermixed in the ſame verſe.

Dimeters.

Δοκιμος δ' ουτις ὑποστας
Μεγαλῳ ρευματι φωτων,
Εχυροις ἑρκεσιν ειργειν
Αμαχον κυμα θαλασσης·
Απροσοιστος γαρ ὁ Περσων
Στρατος, αλκιφρων τε λαος.—Ανακλωμ.

Δολομητιν δ' απαταν θεου
Τις ανηρ θνατος αλυξει;
Τις ὁ κραιπνῳ ποδι πηδη-
-ματος ευπετεος ανασσων.—Æſchylus.

IX. *Pæonic*

IX. *Pæonic Metre.*

1. A pæonic verſe requires all the admiſſible feet to have the ſame rhythm with the proper foot, *i.e.* to conſiſt of five times.

2. The conſtruction is moſt perfect when each metre ends with the ſeveral words of the verſe.

3. Verſes called Bacchiac and Cretic are referrible to this head.

Tetrameters catalectic.

> Εισι τινες ὁι μ' ελεγον, ως καταδιηλλαγην,
> Ηνικα Κλεων μ' υπεταραττεν επικειμενος.
> Και με κακισ͂αι; εκνισ' καθ, ὁ τ' απεδειρομην
> Οικτος, εγελων μεγα κεκραγοτα με θεωμενοι,
> Ουδεν αρ ἐμου μελον. οσον δε μονον ειδεναι,
> Σκωμματιον ει ποτε τι θλιβομενος εκβαλλω.—Ariſtoph.

X. *Of the Pauſe.*

Beſides the diviſion of a verſe into metres and feet, writers have taken notice of another diviſion into two parts only, ariſing from the natural intermiſſion of the voice in reading it. This is called the *pauſe*, which neceſſarily ends with a word. Heroics and trimeter iambics are eſteemed moſt harmonious, when the pauſe falls upon the *firſt ſyllable of the third foot*. In iambic and trochaic tetrameters, its place is *at the end of the ſecond metre*. Theſe rules, which are far from being general, are more obſerved by the Roman than the Greek poets. In anapæſtic and pæonic verſes, and the verſe Ionic à minore, no place is aſſigned to the pauſe; becauſe the effect of a pauſe will be produced at the end of each regularly conſtructed metre.

XI. *Of the different Combinations of Metre.*

1. The firſt is a long ſyllable between the parts of a verſe, as in the common pentameter; thus,

– ⏑ ⏑	– ⏑ ⏑	– ‖	– ⏑ ⏑	– ⏑ ⏑	–
– –	– –				

2. In ſome ſpecies, the portions of an admiſſible foot of four ſyllables are ſeparated by the intermediate metres.

3. It frequently happens that two ſpecies totally diſſimilar are united in the ſame verſe, which is then denominated Ασυναρτητος.

We ſhall employ the mark + to connect the diſſimilar portions, in the following inſtances.

1. Dactyl. tetram. + troch. hemihol.
2. Iambic penth. + troch. hemihol.
3. Dactyl. dim. + troch. monom. or logoœdic verſe.
4. Dactyl. comma prefixed to an iambic dim. which is called elegiambus.
5. Iamb. dim. or Iamb. penth. } prefixed to a dactylic comma, the converſe of the former, and called iambelegus.
6. Dactyl. comma + iamb. hemihol.
7. Iamb. penth. + dactyl. dim.

4. When the parts thus united are an iambic and trochaic ſyzygy, the verſe is called periodic or circulating; the quantity being the ſame as if ſcanned from the end.

5. A verſe agreeing with none of the preceding inſtitutes is termed Πολυσχηματιστος, or anomalous; to which claſs we may refer,

1. A verſe, otherwiſe iambic, having a ſpondee in the ſecond or fourth place.
2. An iambus in a trochaic, &c.
3. Scazon.

"Fit ſcazon, ſi ſpondeo prior exit iambus."

"Ἄκουσᾰθ' Ἱππ|ωνάκτος οὐ | γὰρ ἀλλ' ἥκω."

Of the Figures uſed in Verſification.

The ſyllables compoſing a verſe are affected ſeven different ways: by cæſura, by ſynalæpha, by ecthlipſis, by ſynæriſis, by diæreſis, by ſyſtole, and by diaſtole.

Of Cæſura.—When, after finiſhing a foot, there remains one ſyllable of the word, this circumſtance is called cæſura; a term which is alſo ſometimes applied to the ſyllable itſelf thus *cut off*, and which forms the firſt part of the following foot.

There are four ſpecies of cæſura; the *triemimeris*, *penthemimeris*, *hepthemimeris*, and *ennemimeris*.

The triemimeris is when, after the firſt foot, or two half feet, there remains a ſyllable terminating a word, or a *third* half foot.

The penthemimeris is when, after two feet, or four half feet, there remains a terminating ſyllable, or *fifth* half foot.

The hepthemimeris is when, after three feet, or ſix half feet, a ſyllable remains, which is the *ſeventh* half foot.

The ennemimeris is when, after four feet, or eight half feet, a ſyllable remains, which is the *ninth* half foot.

The firſt three cæſuræ are in the following line:

Silveſ-|trem tenu|-i Mu-|ſam medi|taris a|vena.—Virg.

All are in the following line:

Ille la|-tus nive|-um mol|-li ful|-tus hya|-cintho.—Virg.

Ου χρη | παννυχι|ον ευ|δειν βουληφορον ανδρα.
Hom. Il. β. 24.

Αλλα με|-γα ευ|-χων φλογι εικελα τευχεα παλλων.
Heſiod. Suet. 451.

The preceding are named ſyllabic cæſuras. To theſe may be added the trochaic cæſura, which is formed either by a trochee remaining at the end of a word, after the completion of a foot, or by a word conſiſting of a trochee; as,

Cuncta pri|us ten|-tātă; ſed | immedicabile vulnus.—Ovid.

Per con|-nubia | nōſtră per | inceptos Hymenæos.—Virg.

And the monoſyllabic cæſura; as,

De grege | *nunc* tibi | *vir* nunc | *de* grege | natus habendus.—Ovid.

The principal effects of cæſura are, firſt, to impart ſmoothneſs and elegance to a verſe, by connecting the different words harmoniouſly together; ſecondly, to cauſe a ſhort ſyllable to become long, eſpecially after the firſt, ſecond, or third foot; as,

Pectori|-būs inhians, ſpirantia conſulit exta.—Virg.

Of Synalæpha.—Synalæpha cuts off the final vowel or diphthong of a word, when the following word begins with a vowel or a diphthong; as,

Tērra ān|-tiqua, potens armis atque ubere glebæ.—Virg.

As though it were,

Tērr' ān|tiqua, &c.

The

The Greeks never employ the ſynalæpha, unleſs they join the apoſtrophe; as,

> Ὡς ἔφατ᾽, | ἔδδει|σεν δ᾽ ὁ γέ|ρων, καὶ ἐ|πείθε|το μύθῳ.
> Iliad, α 33.

Synalæpha is ſometimes omitted. Firſt, regularly, as in the interjections O, heu, ah, proh, væ, vah, hei; as,

> *Heu ubi* pacta fides, ubi quæ jurare ſolebas.—Ovid.

Secondly, by poetic licence; as,

> Et ſuccus *pecori*, et lac ſubducitur agnis.—Virg.

Long vowels and diphthongs, when they are not cut off, become common; as,

> *Inſulǣ* Ionio in magno quas dira Celæno.—Virg.
> Ante tibi Eoǣ Atlantides abſcondantur.—Virg.

Of Ecthlipſis.—Ecthlipſis cuts off the final *m*, and the preceding vowel, when the following word begins with a vowel; as,

> Diſce puer, virtut*em* ex me, verumque laborem Fortun*am* ex aliis.—Virg.

This figure is not employed in the Greek language.

The ancients ſometimes retained the *m*, and its preceding vowel, which they made ſhort; as,

> *Corporŭm* officium eſt quoniam premere omnia deorſum.
> Lucret.

But the *um* of officium is elided.

S was formerly elided, not only before a vowel, with the loſs of a ſyllable; but alſo before a conſonant, without the loſs of a ſyllable; as,

> Vicimus, O ſocii! et magnam pugnavimu' pugnam.—Enn.
> Nam, ſi de nihilo fierent, ex omnibu' rebus.—Lucret.

Both ſynalæpha and ecthlipſis are found in the laſt ſyllable of a verſe, when the following verſe begins with a vowel, provided no long pauſe intervene to ſuſpend the ſenſe; as,

> Jamque iter emenſi, turres ac tecta Latinor*um*
> *Ar*dua cernebant juvenes muroſque ſubibant.—Virg.

> Sternitur infelix alieno vulnere cœlum*que*
> *Aſ*picit, et dulces moriens reminiſcitur Argos.—Virg.

Of Synæreſis.—Synæreſis is the contraction of two ſyllables in the ſame word into one ſyllable; as τυχῦ for τυχεῖ; ĭi for iï, deĭnde for deïnde; abiete pronounced abyĕte for abiĕte, &c.

And in the following verſes for parietibus, tenuius, vindemiator, pronounce păr-yĕtibus, tĕn-wĭŭs, vindĕm-yātor.

> Hærent părĭĕtibus ſcalæ; poſteſque ſub ipſos.—Virg.
> Quâ nec mobilius quidquam neque tĕnuĭŭs exſtat.—Lucr.
> Vindēmiātor et invictus cui ſæpe viator.—Hor.

Of Diæreſis.—Diæreſis is the diviſion of one ſyllable into two; as πυΐλη for πυλη, auraï for auræ, ſŭëſco for ſŭēſco, ſiluæ for ſilvæ, ſoluit for ſolvit, ſubiecta for ſubjecta, Jüpiter for Jupiter, &c.

Of Syſtole.—Syſtole is the ſhortening of a ſyllable, otherwiſe long by nature or poſition; as τας τεχνᾶς ἐγνεσι, Theocr.; vidĕn. for vidēs ne, hŏdie for hōc die, ŏbicis for ōbjicis, &c.

Of Diaſtole.—Diaſtole is the lengthening of a ſyllable, otherwiſe naturally ſhort; as Ηρωων αυτους δ᾽ ἑλωρια τευχε κυνεσσιν, Hom. Il. α. 4. So are the firſt ſyllables in Prīamides, Ārabia, occaſionally lengthened; without which licence, theſe and ſome ſimilar proper names would ſcarcely be admiſſible in heroic verſe.

There are other figures which may affect a verſe, but theſe belong to etymology.

Latin Verſification.

I. An hexameter or heroic verſe conſiſts of ſix feet, of which the fifth is uſually a dactyl, the ſixth a ſpondee: the reſt may be either ſpondees or dactyls, at the option of the poet. The following ſcale exhibits the conſtruction:

1.	2.	3.	4.	5.	6.
- ᴗ ᴗ	- ᴗ ᴗ	- ᴗ ᴗ	- ᴗ ᴗ	- ᴗ ᴗ	- -
- -	- -	- -	- -		

> Āt tŭbă | tērrĭbĭ-|-lēm ſŏnĭ|tūm prŏcŭl|ǣrĕ ca-|-noro.
> Virg.

Sometimes when the deſcription is grave, ſlow, majeſtic, mournful, &c. a ſpondee is admitted in the fifth place, and the verſe is called ſpondaic. In this caſe, a dactyl uſually occupies the fourth place, and the verſe terminates with a word of three or four ſyllables. It is but ſeldom otherwiſe; as,

> Conſtitit atque oculis Phrygia | *agmina* | circūm|-ſpexit.—Virg.

Hexameters abounding too much in ſpondees may appear to drag, as it were, heavily; and thoſe in which dactyls prevail ſeem ſometimes to have a light and fluttering effect. An equal admixture, therefore, has been thought to afford the juſt and moſt harmonious medium.

A proper regard to the cæſura, in the ſtructure of an hexameter, is indiſpenſably neceſſary. The term cæſura is uſed by grammarians in two ſenſes. In the former, it ſignifies the diviſion of a verſe into two portions, affording a little pauſe or reſt for the voice, at ſome convenient place, where the pauſe may take place without injury to the ſenſe or harmony of the line. This kind of cæſura is ſometimes called a *tome*, which term, for diſtinction's ſake, we ſhall in this former ſenſe excluſively employ.

> Tantæ molis erat ∞ Romanam condere gentem.—Virg.

> Errabant, acti fatis ∞ maria omnia circum.—Virg.

From theſe examples, it is evident that the tome is not excluſively confined to a particular part of the hexameter, as in the pentameter, which, like the Engliſh and French Alexandrine, is invariably divided into two equal portions.

But the tome moſt approved in heroic verſe was the penthemimeral; as,

> Lūctān-|-tes vēn-|-tos, ∞ tempeſtateſque ſonoras.—Virg.

Inſtead, however, of the tome at the exact penthemimeris, a different diviſion was admitted after a trochee in the third foot; as,

> Effīgi-|-ēm ſtātŭ-|-ērĕ, ∞ nĕfas quæ triſte piaret.—Virg.

This, however, is generally cenſured, as the ear ſeems to require that there ſhould be no pauſe immediately after a trochee in this place, eſpecially as the voice, which would find an agreeable reſt on a long ſemifoot, is diſagreeably ſuſpended on a ſhort ſyllable.

The

The hepthemimeral tome was alſo approved as heroic; as,

Clāmō|-rēs sĭmŭl | hōrrēn-|-dōs ad ſidera tollit.—Virg.

The tome after the third foot has been the ſubject of critical cenſure, though Virgil, the princeps facilè poetarum, has on a *few* occaſions employed it. The penthemimeral or hepthemimeral tome is, however, unqueſtionably preferable.

The tome between the fourth and fifth feet has been conſidered as peculiarly adapted to paſtoral verſe, and therefore called tome Bucolica; as,

> Stānt vĭtŭ-|-li, ēt tĕnĕ-|-rĭs mū-|-gītĭbŭs| aëra complent.—Nemeſian.

But this pauſe occurs as frequently in heroic as in paſtoral verſe.

In the ſecond acceptation, the cæſura means the diviſion or ſeparation which takes place in a foot, when that foot is compoſed of ſyllables belonging to different words.

A verſe in which this cæſura is neglected, in which the inſulated and unconnected feet ſeem to ſhun all ſociety with each other, is held to be ſtiff and uncouth in the extreme, and devoid of all poetic elegance; as,

> Spārsīs | hāſtīs | lātē | cāmpūs | ſplēndēt ĕt | hōrrēt. Ennius.

On the contrary, thoſe verſes are the moſt pleaſing in which this figure abounds; and this effect is equally produced, whether the diviſion take place before a ſemifoot or before a *ſolid* trochee.

N. B. By a *ſolid* trochee is meant a trochee conſiſting of a ſingle word, or the laſt two ſyllables of a word; not a ſemifoot joined with a ſhort monoſyllable.

> Tē ſpēc-|-*tēm*, ſū-|*prēmă* mĭ-|hī quum | vēnĕrĭt | hōrā. Tibullus.

But two ſucceſſive trochees of this kind occurring in the ſecond and third, or in the third and fourth feet, ſhould be avoided; but in the firſt and ſecond, or in the firſt, third, and fifth, they are unobjectionable.

After the firſt foot, the neglect of the cæſura is no blemiſh, provided that foot be a dactyl; as,

> Rēgĭā | ſolis erat ſublimibus alta columnis.—Ovid.

Nor after a ſpondee is it much felt, eſpecially if it be an emphatic word; as,

> Tāndēm | progreditur, magnâ ſtipante catervâ.—Virg.

Nor is the want of the cæſura felt after the ſecond foot, if it be a ſpondee concluding with a monoſyllable; as,

> Ah quo|ties per | ſaxa canum latratibus acta eſt.—Ovid.

The cæſura, at the third foot, is held to be, if not abſolutely neceſſary, highly deſirable. When the tome, however, takes place at the penthemimeris, and there is no pauſe at the cloſe of the third foot, no objection can be made to its terminating, either with a long monoſyllable, two ſhort monoſyllables, or a diſſyllabic word; as,

> Contem-|-nuntque fa-|-*vōs*, *ēt* | frigida tecta relinquunt. Virg.
>
> Scindit | ſe nu|*bēs*, *et in* | æthera purgat apertum. Virg.
>
> Et ſemel | emiſ-|-*ſūm* *vŏlăt* | irrevocabile verbum Hor.

The cæſura is ſeldom introduced after the fourth foot; it is then generally unneceſſary, and when it occurs the verſe is not harmonious; as,

> Omnes innocuæ; ſed non pup|*pis* tua Tarchon.—Virg.
>
> Vertitur interea cœlum, et ruit ocean|*o* nox.—Virg.

When formed by a monoſyllable, and when the verſe is ſpondaic, it is unobjectionable; as,

> Explorare labor: mihi juſſa capeſſere fas eſt.—Virg.
>
> Perſolvit pendens e vertici|būs præruptis.—Catul.

II. *Neglected Hexameters.*

In the epiſtles and ſatires of Horace are hexameters, which, from their ſtudied *negligence*, and their want of all the characteriſtic majeſty of the heroic, have received this appellation. They are not, however, devoid of either beauty or ſimplicity; and Horace has ſucceſsfully employed them in occaſionally drawing the portrait of the foibles and paſſions of mankind; as,

> Rure ego viventem, tu dicis in urbe beatum:
> Cui placet alterius, ſua nimerum eſt odio ſors.
> Stultus uterque locum immeritum cauſatur iniquè
> In culpâ eſt animus, qui ſe non effugit unquam.

The following verſe conſiſts either of the beginning or latter part of an hexameter.

1. The Archilochian penthemimer or dimeter, named from Archilochus, its inventor, conſiſts of two dactyls and one ſyllable, and therefore named hypercatalectic; as,

> Pūlvĭs ĕt | ūmbră sŭ-|-mus.—Hor.

2. The Alcmanian dactylic trimeter, firſt uſed by Alcman, conſiſts of three dactyls and a hypercatalectic ſyllable; as,

> Nōſtră dĕ-|-ūs cănĕt | hārmŏnĭ-|a.—Prudent.

This verſe, like the hexameter, of which it is a part, admits a ſpondee in the firſt, ſecond, and third places.

3. The Alcmanian dactylic tetrameter acatalectic admits in the firſt, ſecond, and third places, either a dactyl or ſpondee; in the fourth, a dactyl only; as,

> Lūmĭnĭ-|būſquĕ prī-|-ōr rĕdĭ-|-ĭt vĭgŏr.
> Nimbōſ-|-īſquĕ pŏ-|-lūs ſtĕtĭt | īmbrĭbŭs
> Dēsūpĕr | ĭn tēr-|-rām nox | fūndĭtŭr.—Boët.
>
> Sōlvĭtŭr | ācrĭs hȳ-|ēms grā-|-tā vĭcĕ.—Hor.

4. The Alcmanian tetrameter acatalectic contains the laſt four feet of an hexameter, of which, of courſe, the third is a dactyl, and the laſt foot a ſpondee; as,

> Ībĭmŭs | ō ſŏcĭ-|-ī cŏmĭ-|-tēſque.—Hor.

A ſpondee may precede the laſt foot, provided a dactyl precede it; as,

> Mēnſō-|-rēm cŏhĭ-|-bēnt Ār-|-chȳtā.—Hor.

5. The Alcmanian tetrameter catalectic contains one long ſyllable, or two ſhort ſyllables, then a dactyl or ſpondee; afterwards a dactyl; and laſtly a ſpondee.

> Quī | ſē vŏlĕt | ēſſĕ pŏ-|-tēntem
>
> Ănĭ-|-mōs dŏmĕt | īllĕ fĕ-|-rōces.—Boët.

6. The Alcmanian tetrameter hypercatalectic contains an heroic penthemimer and an adonic (ſee N° VI.); as,

> Hēū quām | præcĭpĭ-|-ti || mērſă prŏ-|-fundo.—Boët.

7. The

7. The tetrameter acatalectic consists of three dactyls and a pyrric, or iambus; as,

Qui sērē-¦-re ĭngĕnŭ-¦-ūm vŏlĕt | ăgrum.—Boët.

8. The Bucolic hexameter has in the fourth place a dactyl; as,

Ab Jove principium, Musæ; Jŏvĭs omnia plena.—Virg.

Fortunatianus observes, that Theocritus adhered to this rule in his pastorals, and that Virgil often neglected it.

9. The hexameter, which is named miurus or teliambus, having for its last foot an iambus instead of a spondee; as,

Dirige odorisequos ad cæca nubilia canes.—Liv. Andron.

The two alcaics will be noticed hereafter.

III. *Of the Pentameter.*

The pentameter verse consists of five feet, of which the first two may be either dactyls or spondees, the third must always be a spondee, the fourth and fifth anapæsts.

It appears from Quinctilian that this was the ancient mode of scanning the pentameter. (Inst. ix. 4.) But among the moderns it is scanned otherwise. By dividing the verse into two hemistichs or penthemimers, the first hemistich must contain two dactyls or two spondees, or one of each indiscriminately, and a long syllable, or cæsura; in the latter hemistich, two dactyls with another cæsura; thus,

Cārmĭnĭ-|būs vī-|vēs || tēmpŭs ĭn | ōmnĕ mĕ-¦-is.—Ovid.

1. The first hemistich ought to end with the entire word, that the cæsura belonging to the penthemimer may take place; otherwise it will not be a legitimate pentameter, according to Quinctilian, ix. 4. "In medio pentametri spondeo, qui nisi alterius verbi fine, alterius initio constet, versum non efficit." Therefore Terentianus condemns the following line.

Īntĕr | nōstrōs | gēn-||-tīlĭs ŏ-|-bērrăt ĕ|quus.

2. An elision immediately after the penthemimer is harsh; as,

Mī mise-|ro eripu-|-*isti* || omnia | nostra bo-|-na.

which verse is rendered still more harsh by the elision in the preceding foot.

3. Neither hemistich should end with a monosyllable, except it be preceded by another monosyllable, or an elision.

4. The most eligible conclusion of a pentameter is a dissyllable, or a word of four or five syllables. But the verse of Ovid, Propertius, or Tibullus, seldom ends with a trisyllable.

5. A pentameter subjoined to an hexameter constitutes an elegiac distich; as,

Flebilis indignos, elegeïa, solve capillos.
Ah nimis ex vero nunc tibi nomen erit!

6. Every distich should terminate with a period, or colon.

7. Rhyming must be avoided in this and every other kind of Latin verse; as,

Quærebant flav*os* per nemus omne fav*os*.

Such verses are called Leonine, or monkish, from Leonius, a Benedictine monk, who is censured by Vossius and others for affecting this mode of versifying.

IV. *Of the Asclepiadic, or Choriambic.*

This verse, invented by the poet Asclepiades, consists of four feet, a spondee, two choriambi, and a pyrric; or, considering the last syllable of the verse as long, an iambus; thus,

Mæcē|nās ătăvĭs | ēdĭtē rē|gibus.—Hor.

1. Sometimes the first foot was a dactyl; as,

Effŭgĭ-|-ūm ēt mĭsĕrōs | lībĕră mōrs | vehit.—Seneca.

2. Sometimes, but seldom, a spondee was admitted into the second and fourth places; as,

Tēndĭt ĭn | ēxtēr-|-nas ire tenebras.—Boët.

3. Single feet are elegantly composed in this verse of complete words; as,

Quāssās | indŏcĭlis | pāupĕrĭēm | păti.—Hor.

4. The first choriambus, or a cæsura, falls inelegantly in the middle of a word; as,

Non in-|cēndĭă Cārth|āgĭnĭs īm|-piæ.

Unless there be an ecthlipsis, a synalæpha, or the word be a compound; but even then the lines lose not all their harshness, and are but seldom to be imitated.

There are, likewise, the following varieties in choriambic verse.

1. The Aristophanian choriambic dimeter acatalectic, consisting of a choriambus and a bacchic, or an amphibrac; as,

Lȳdĭă dic | pĕr ōmnes.—Hor.

2. The Alcaic pentameter acatalectic, consisting of a spondee, three choriambi, and a pyrric; as,

Sēu plū|rēs hĭēmēs | sēu trĭbŭĭt | Jūpĭtĕr ūl-|-tĭmam.
Hor.

3. The Alcaic epichoriambic tetrameter acatalectic, consisting of the second epitrite, (a choree and a spondee,) two choriambi, and a bacchic; as,

Tē Dĕōs ŏ-|ro Sȳbărĭn | cūr prŏpĕrēs | amando.—Hor.

V. *Of the Glyconic.*

The Glyconic verse, so named from the poet Glyco, consists of a spondee, a choriambus, and an iambus; as,

Sīc tē | dīvă pŏtēns | Cȳpri.—Hor.

But the first foot was sometimes varied to an iambus; or a trochee: but Horace, who was partial to the Glyconic, invariably adheres to the spondaic commencement, except in one solitary instance; *viz.* ode i. 15. 36.

VI. *Dactylic Dimeter, or Adonic.*

The Adonic verse consists of two feet, the first a dactyl, the other a spondee; as,

Vīsĕrĕ | mōntēs.—Hor.

We seldom find this verse employed alone. Terentianus Maurus (De Metr. 439.) informs us that Sappho wrote entire poems in this short measure. Terentianus himself has also left us a short piece of the kind; and another of thirty-one successive adonics occurs in Boëthius, lib. i. metr. 7.

VII. *Of the Sapphic Pentameter.*

The Sapphic verse, so named from the poetess Sappho, consists of five feet; the first a trochee, the second a spondee,

ſpondee, the third a dactyl, and the fourth and fifth trochees; as,

Dēflū-¦-it ſax-|-īs ăgĭt-¦-tātŭs | hūmŏr.—Hor.

1. The penthemimeral cæſura adds that elegance to Sapphic verſe, without which it does not flow harmoniouſly.

2. Sappho and others admitted ſometimes, in the firſt place, a ſpondee, or a pyrric; as,

Αἰ᾽ ἀλλ᾽ | ἐξικοντο τυ δ᾽ ω μακαιρα.—Sappho.

Pŏsĭ-¦tis tandem levibus ſagittis.—Seneca.

3. Sappho, Catullus, and Seneca, ſometimes made the ſecond foot an iambus, a trochee, or a dactyl; as,

Χρυσε-|-ομῖ¦-τρα δαῖφρων σπασσα.—Erinna.

Παι Δι-|-ος δο-¦-λοπλοκε, λισσομαι σε.—Sappho.

Quæque ad | Hēſpĕrĭ-|-as jacet ora metas.—Seneca.

Horace, however, who in many inſtances improved upon the invention of Sappho, invariably adheres to that form which has the ſecond foot a ſpondee; and the young poet, if he be prudent, will not paſs beyond his limits.

4. Sapphic verſe appears ſometimes to be hypercatalectic, but in this caſe the final vowel of the line ſuffers the eliſion conſequent on the following verſe beginning with a vowel.

5. Inſtances occur in Sappho, Catullus, and Horace, of the diviſion of a word between two lines; as,

Groſphe, non gemmis, neque purpura *ve-*
-nale, nec auro.—Hor.

It has been conjectured, however, that the cauſe of this peculiarity in the Sapphic is, that neither Sappho, Catullus, nor Horace, intended the ſtanza to conſiſt of four, but of three ſeparate verſes; *viz.* two ſapphics, and one verſe of ſeven feet; as,

Otium bello furioſa Thrace,
Otium Medi pharetrâ decori,
Groſphe, non gemmis, neque purpura venale, nec auro.
Hor. Od. ii. 16. 5.

6. However, we moderns uſually conſider the ſtrophe to conſiſt of three ſapphics and an adonic: ſee No. VI.; as,

Quid brevi fortes jaculamur ævo
Multa? Quid terras alio calentes
Sole mutamus? Patriæ quis exul
Se quoque fugit.—Hor. Od. ii. 16. 17.

VIII. *Of the Phalæcian Verſe.*

The Phalæcian verſe, denominated from the poet Phalæcius, conſiſts of five feet, *viz.* a ſpondee, a dactyl, and three trochees; as,

Nōn ēſt | vīvĕrĕ, | ſēd vă-¦lērĕ, | vītă.—Martial.

1. This verſe neither rejects nor requires a cæſura.

2. Sometimes the firſt foot was made an iambus or a trochee by Catullus, but by the poets poſterior to Catullus, not more than two or three ſolitary inſtances of this anomaly can be proved from an analyſis of ſome thouſand verſes.

3. The ſame poet has in ſome inſtances alſo ſpoiled the elegance and harmony of his meaſure by introducing a heavy ſpondee into the ſecond place, but his example was not imitated by his more poliſhed ſucceſſors.

4. The term hendecaſyllabic (as employed by ſome) is not applicable excluſively to the Phalæcian verſe, ſince the epithet is equally ſuitable to the Sapphic and to the Alcaic verſe.

IX. *Of the Pherecratic Verſe.*

This verſe, invented by Pherecrates of Athens, conſiſts of what may be the three laſt feet of an hexameter; *viz.* a ſpondee, a dactyl, and a ſpondee; as,

Nīgrīs | æquŏră | ventis.—Hor.

1. Boëthius ſometimes admits an anapæſt in the firſt place; as,

Sĭmĭlī | ſurgĭt ăb | ortu.

2. Catullus ſometimes admits in the firſt place a trochee, or an iambus, and at others, in the laſt place, a dactyl; as,

Prōdĕ-¦-as nova | nupta.
Pŭēl-¦-læque că-¦-namus.

X. *Of the Iambic Verſe.*

Iambic verſes take their name from the iambus, which in pure iambics was the only foot admitted. The two moſt common kinds are the dimeter and the trimeter; as,

I.		II.		III.	
Ĭnār-	-sĭt æ-	-ſtŭō-	-sĭūs		
Sŭīs	ĕt īp-	-să Rō-	-mă vī-	-rĭbūs	rŭĭt.—Hor.

1. But in order both to facilitate and dignify the compoſition, ſpondees were admitted into the odd places; as,

1	2	3	4	5	6
Fōrtī	sĕquē-	-mūr pēc-	-tŏre		Hor.
Pārs sā-	-nītā-	-tis vēl-	-lĕ sā-	-nārī	fŭĭt.—Seneca.

2. The former of theſe makes two thirds epitrite, and the latter three.

3. And inſtead of an iambus and a ſpondee, their iſochronal feet were admitted inſtead of them, *i. e.* in the odd places, an anapæſt, a dactyl, and ſometimes a tribrac; and alſo in the even places, (except the laſt, which always requires an iambus,) a tribrac: the ſcale of the mixed trimeter iambic is, therefore, as follows:

1.	2.	3.	4.	5.	6.
⏑ –	⏑ –	⏑ –	⏑ –	⏑ –	⏑ –
⏑ ⏑ ⏑	⏑ ⏑ ⏑	⏑ ⏑ ⏑	⏑ ⏑ ⏑	⏑ ⏑ ⏑	
– –		– –		– –	
– ⏑ ⏑		⏑ ⏑		– ⏑ ⏑	
⏑ ⏑ –		⏑ ⏑ –		⏑ ⏑ –	

4. The comic poets not only admitted theſe feet, but alſo the amphibrac, proceleuſmatic, and bacchic into the even as well as the odd places, the laſt always excepted; and almoſt all the fables of Phædrus are written in the following manner:

Āmĭt-¦-tĭt mĕrĭ-¦-tō prŏprĭ-¦-ūm, qui ălĭ-¦-ēnum
ăp-|-pĕtit
Făcit | părēn-¦-tēs bŏnĭ-¦-tās nōn | nĕcēs-|-sĭtās.

The following are the varieties of the iambic.

1. The iambic monometer, or binarius, conſiſting of two iambi; as,

Căvē | mălūm
Tĕnē | bŏnūm.

2. The iambic dimeter conſiſts of two metres, or four feet, properly

properly all iambuses; it admits, however, the same variations as the trimeter; as,

Fŏrtū-|-nă nōn || mūtāt | gĕnus.—Hor.
Ăſt ĕgŏ | vĭcĭs-||-sim ri-¦-sĕrō.—Hor.

Prudentius, and several posterior authors, wrote entire poems in this metre.

3. The Archilochian trimeter catalectic, which in the first place has an iambus or spondee, in the second an iambus, in the third a spondee, in the fourth and fifth an iambus with a common syllable; thus,

Trăhūnt-|-quĕ sic-|-cās mā-|-chĭnæ | cărī-|-nas
Nēc prā-|-ta că- | -nīs āl-|-bĭcānt | prŭī-|-nis.—Hor.

4. The Archilochian trimeter catalectic differing from the last in this, that it admits a spondee or iambus in the third place; as,

Mĕā | rĕnī-|-dĕt īn | domo | lacu-|-nar.
Premunt | colum-|-nās ūl-|-timâ | recis-|-as.—Hor.

5. The Galliambic trimeter (so named from the Galli or priests of Cybele) acatalectic consists of six feet, of which the first is an anapæst, the second and third an iambus, the fourth and fifth a dactyl, and the sixth an anapæst; as,

Super al-|-ta vec-|-tus A-|-tys cele-|-ri rate | maria
Phrygium | nemus | cita-|-to cupi-|-dè pede | tetigit
Adiit- | -que opa-|-ca fil-|-vis redi-|-mita lo-|-ca Deæ.
Catullus.

This verse has always an iambus in the third verse place, in the fifth a dactyl, and in the sixth a spondee. In the second, however, it admits an anapæst or a tribrac; and in the fourth, a spondee. It is but seldom that other feet are admitted, viz. in the first place a spondee, a cretic, or a proceleusmatic; in the second, a spondee and its isochronal foot, a dactyl; in the fourth an iambus.

6. The Saturnian trimeter hypercatalectic, which has a spondee in the fourth place, and in the other five iambi, with the hypermeter syllable at the close; as,

Dabunt | malum | Metel-|-li Næ-|-vio | Poë-|-tæ.
Ter. Maur.

7. The Hipponactic tetrameter catalectic consists of seven iambi and a long syllable, and sometimes admits a spondee into the odd places; as,

Et in | solen-|-ter æſ-|-tues | velut | minu-|-ta mag-|-no.
Depren-|-ſa na-|-vis in | mari | vēsā | nien-|-te ven-|-to.
Catullus.

8. The tetrameter, or octonarius acatalectic, contains eight feet, of which the last is always an iambus; in the other even places are iambuses or tribracs; in the odd places, iambuses or spondees, or their isochronal feet, tribracs, anapæsts, or dactyls; as,

Suſpi-|-cio-|-ſi ad con-|-tume-|-liam om-|-nia ac-
|-cipiunt | magis.—Terence.

Comic writers admit not only in this, but also in the trimeter and catalectic tetrameter, such feet, in the even places, as are generally used in the odd places, and *vice versâ*; the last place excepted, in which there is always an iambus.

Of the Scazon, or Choliambus.

The scazon or choliambus (*i. e.* lame iambic), so named, because in it the cadence is inverted, or maimed, by the change of feet in the two last places, consists of six feet, of which the fifth is invariably an iambus, and the sixth a spondee, the others being the same as in the iambic trimeter; as,

Ō quĭd | ſŏlū-|-tis eſt | bĕā-|-tĭūs | cūrĭs?—Catul.

Of the Anacreontic.

The name of the celebrated lyric poet Anacreon forms the distinguishing epithet that characterizes this verse; which is nothing else but the iambic dimeter catalectic. The first foot is an iambus, often a spondee or anapæst, sometimes a tribrac or a cretic; the second and third are iambuses, with an additional syllable at the end; as,

Ὁπόσα | φερου-|-σιν ὑ-|-λαι.—Anac.
Lēx hæc | dătă ēſt | cădū-|-cis.—Prudent.
Hăbĕt ōm-|-nĭs hŏc | vŏlŭp-|-tas.—Boët.

Of the Trochaic.

The trochaic verse admits, in the odd places, a trochee or a tribrac; but in the last place a trochee only; in the even places, besides the trochee and tribrac, a spondee, a dactyl, or an anapæst, but a proceleusmatic was seldom admissible. It rejects the iambus, as the iambus does the trochee.

The most common trochaic verse is the tetrameter catalectic, which consists of seven feet, (properly all trochees,) followed by a catalectic syllable; as,

Jūſſūs | ēſt ĭn-|-ĕrmĭs | īrĕ: || pūrŭs | īrĕ | jūſſūs eſt.
Catullus.

1. Although iambic and trochaic verses seem opposite in their nature, yet as in each, single short and long syllables alternately recur, the retrenchment of the initial syllable of either, transforms it into the other, *i. e.* the iambic into the trochaic, and the trochaic into the iambic. This circumstance has induced some, particularly the author of the Port Royal grammar, to deny the existence of trochaic verse, and to denominate them acephalous iambics.

2. In the trochaic tetrameter, the cæsura ought to be altogether avoided *after* the fourth foot, which divides the verse into two hemistichs.

3. The comic writers use, in trochaic verse, the same liberties in regard to the choice of the feet as in iambics, planting promiscuously, in the odd places, such feet as others admit in the even places, the seventh foot alone excepted.

Of trochaic verse we have the following species.

1. The trochaic monometer hypercatalectic contains two trochees and the hypermeter syllable; as,

Nūllă | jām fĭ-|-des.—Scalig.

2. The trochaic dimeter brachycatalectic contains three trochees; as,

Huc a-|-des Ly-|-æe.—Scalig.

3. The Euripidean dimeter catalectic consists of three trochees, (in the second place sometimes a spondee or a dactyl,) with a catalectic syllable; as,

Dōnă | cōnſcĭ-|-ēntĭ-|-æ.—Prudent.
Vītă | dĕcūr-|-rēns vĭ-|-ā.—Seneca.
Lēnĭs | ăt mŏdĭ-|-cūm flŭ-|-ens.—Idem.

4. The Alcmanic dimeter acatalectic contains four trochees;

chees; but it admits, in the second place, a spondee, or its isochronal feet, a dactyl or anapæst; as,

Nŏn fă-|-cĭt quŏd | ōptăt | īpsĕ.—Boët.

Ǣrĕ | tŏrvō | cōmmĭ-|-nāntĕs.—Boët.

Cōnscĭ-|-ŏs scĕlĕ-|-rĭs nĕ | fāndi.—Buch.

5. The Anacreontic dimeter acatalectic has, in the first place, a pyrric, in the other three trochees; as,

Rĕdĭ-|-mita | vere | tellus.—Claud.

6. The Hipponactic tetrameter acatalectic consists of eight trochees; but it admits in the even places a spondee and its isochronal feet, an anapæst, a dactyl, and sometimes a proceleusmatic, and in the odd places a tribrac; as,

Appe-|-tente | vere | primo | cum te-|-ner vi-|-rescit | annus.—Scalig.

But the comic writers reserved to themselves the same licence which characterizes their catalectic iambic tetrameters, and introduce all the above-mentioned indiscriminately in any place.

Of the Anapæstic.

Anapæstic verse is so named, because in any place of it an anapæst may be used. It admits, however, so freely the isochronal feet, (the spondee and the dactyl,) that there is frequently not one anapæst in an anapæstic verse.

1. The anapæstic dimeter acatalectic is seldom found in its pure state; as,

Phărĕtræ-|-quĕ grăvēs | dătĕ sæ-|-vă fĕrō.—Seneca.

But the sweetest and most common kind, is that which is named the Aristophanian or Pindaric, which consists of an admixture of dactyls, spondees, and anapæsts, excluding, however, generally the dactyl from the second and fourth places; as,

Qūantī | cāsūs | hūmă-|-nă rotant:
Mĭnŭs īn | pārvīs | fōrtū-|-nă fŭrit,
Lĕvĭūs-|-quĕ fĕrīt | lĕvĭō-|-ră Dĕūs.—Seneca.

The pyrric, the trochee, and the tribrac, were occasionally substituted for the anapæst. The young poet must here observe, that those anapæstics are the most harmonious which are without the cæsura; and next to these in elegance are the lines in which each dipodia terminates with a word.

2. The Simonidian dimeter acatalectic consists of an anapæst, a dactyl, or a spondee, in the first place, and in the last an anapæst or spondee; as,

Dēflē-|-tĕ vĭrūm
Quō nōn | ālĭūs
Pŏtŭīt | cĭtĭūs
Dīscĕrĕ | cāusās
Ūnā | tāntūm
Pārte aū-|-dītā
Sæpe ĕt | nēutrā.—Seneca.

3. The Parthenic tetrameter catalectic, having in the first and second places either an anapæst or a spondee; in the third only an anapæst; and, lastly, the catalectic syllable; as,

Ŭtĭnām | mŏdŏ nōs-|-tră rĕdī-|-rent
In mō-|-rēs tem-|-pŏră prīs-|-cos.—Boët.

4. The Archebulian pentameter acatalectic, (denominated from the inventor Archebūlus,) consists of four anapæsts and a bacchic; thus,

Gĕnĕrī | dătūr aūc-|-tŏr hŭīc | vĕtŭs Ār-|-chĕbūlus. Terent.

Of the greater Alcaic.

The greater Alcaic is an hypercatalectic tetrameter, consisting of an iambic penthemimer, followed by a choriambus and an iambus; as,

Cœlēs-|-tĭs ār-|-cĭs || nōbĭlĭs īn-|-cŏla.—Prudent.

The cæsura more frequently occurs in the last syllable of a word at the catalectic syllable, as above. In Horace, however, the cæsura is sometimes found in the beginning of a word, sometimes in the middle, and sometimes it is a monosyllable.

In the first place, Horace has *seldom* an *iambus*, but *generally*, and Prudentius *always*, *a spondee*.

Of the less Alcaic.

This metre consists of two dactyls, followed by two trochees; and is, therefore, a dactylico-trochaic tetrameter; as,

Lēvĭă | pērsŏnŭ-|-ērĕ | sāxă.—Horace.

Of the Pyrric.

In Terentianus and Ausonius we find a pyrric tetrameter catalectic; as,

Pĕrĭt | ăbĭt | ăvĭ-|-pĕdĭs | ănĭ-|-mŭlă | lĕpŏ-|-ris. Terent.

Of the Ionic à Majore.

1. The pure great ionic tetrameter acatalectic consists of four great ionics; as,

Fēcit sătĭs | ægrūm răbĭ-|-ēm qui dŏmŭ-|-it fēmĭnæ. Scalig.

2. The mixed great ionic, (or Sotadic, from the poet Sotades,) consists of three great ionics and a spondee; as,

Vōcālĭă | quædām mĕmŏ-|-rānt cōnsŏnă | quædām. Terent.

This kind of verse oftener admits, in the third place, a dichoree instead of a great ionic; thus,

Has cum gemi-|-na compede | dedicat ca-|-tenas. Mart.

It admits also, in all the places but the last, the second pæon, the second epitrite, and the dichoree; and in almost every place a long quantity may be resolved into short syllables.

Of the Ionic à Minore.

This verse receives its name from the foot, the ionic à minore, which it employs in every place. It is more usually either a trimeter or tetrameter. Thus Horace, Carm. iii. 12. after two trimeters places a tetrameter; as,

Mĭsĕrārūm ĕst, | nĕque āmōrī | dārĕ lūdūm
Nĕque dūlcī | mălă vīnō | lăvĕre āut ēx-
ănĭmārī | mĕtŭēntĕs | pătrŭæ vĕr-|-bĕră līnguæ.

The learned Bentley was, however, of opinion, that this composition of Horace's consists of ten small ionics, without any pause, and that, therefore, the whole of the ode is finished in four decapodiæ of this kind.

Of

Of Mixt Verses.

Verses are said to be mixt, when two of different kinds are united. Amongst the Latin poets we find the following variety.

1. The Archilochian pentameter consists of two members, the first a dactylic tetrameter *à priore*, the latter is a trochaic dimeter brachycatalectic; as,

Sōlvitur | acris hi-|-ēms grā-|-tā vĭcĕ || vēris | ĕt Fă-|-vōni.—Hor.

2. The Archilochian elegiambic; of which the first member is the latter part of an elegiac pentameter, or the Archilochian dactylic penthemimer, (consisting of two dactyls and a syllable,) the second member, the iambic dimeter acatalectic; as,

Scrībĕrĕ | vērsĭcŭ-|-los, || ămō-|-re per-|-cūssūm | gravi. Ho

which is commonly thus divided into two verses:

Scribere versiculos
Amore percussum gravi.

3. The dactylic hexameter acatalectic consists of two divisions of an hexameter, each of three feet, but in such a manner, that in the first place of each there is a spondee, or a trochee, or iambus; in the second and third place of the first division, there is a dactylus; in the second place of the second division a dactyl, and the third or last a spondee. In this kind of verse the last syllable of the first division is accounted common; as,

Nām tē | præcīpŭ-|-e īn sŭīs || ūrbĭ-|-bŭs cŏlĭt | ōra. Catul.

4. The iambelegiac (the converse of No. 2.), in which the first division is iambic, and the second elegiac; thus,

Nĭvēs-|-quĕ dē-|-dūcūnt | Jŏvēm: || nūnc mărĕ | nūnc sĭlŭ|æ.—Hor.

Commonly thus divided,

Nivesque deducunt Jovem:
Nunc mare nunc silüæ.

5. The choriambic dactylic; in which the first division is the Glyconic, having generally in the first place a trochee; the second division is the Pherecratic, with a trochee also in the beginning; thus,

Ō Cŏ|lōnĭă quæ | cŭpĭs || pōntĕ | lūdĕrĕ | lōngō.—Catul.

6. The choriambic trochaic; of which the first division is the choriambic dimeter, or two choriambuses: the second, the trochaic dimeter brachycatalectic, of which the first foot is a dactyl, the other two trochees; thus,

Vēstĭăt Al-|-pīnŭs ăpēx || ĕt rŭbĕ-|-ānt prŭ-|-ĭnæ. Claud.

7. The trochaic dactylic; of which the first division is a trochaic penthemimer; that is, in the first place there is a trochee, in the second a spondee or dactyl, with an additional syllable; and the second part is an adonic; as,

Sī quĭs | Ārctŭ-|-ri || sīdĕră | nescit.
Cūm ni-|-mis cĕlĕ-|-rēs || ēxplĭcĕt | ōrtus.—Boët.

8. The iambic dactylic; of which the first is an iambic penthemimer, consisting of two iambi, with a long syllable, but oftener in the first place a spondee, and sometimes in the second a tribrac; and in the last part an adonic; thus,

Prŏpīn-|-quă sūm-|-mō || cārdĭnĕ | lābi
Mērgāt-|-quĕ sē-|-ras || æquŏrĕ | flammas.—Boët.
Stŭpēt-|-quĕ sŭbĭ-|-tis || mōbĭlĕ | vulgus.

Of Compositions in which the Verse is varied.

From what has been already said, it appears that there are five different species of composition, consisting of a combination of various kinds of verses, and in each there are generally several varieties.

I. *Of the Carmen Dicolon Distrophon.*

1. The elegiac distich is already explained. See Pentameter, Obs. 5.

2. An hexameter with an Archilochian dactylic penthemimer; as,

Diffugere nives; redeunt jam gramina campis
Arboribusque comæ.—Hor.

3. An hexameter with an Alcmanian dactylic tetrameter acatalectic; as,

Tunc me discussa liquerunt nocte tenebræ,
Luminibusque prior rediït vigor.—Boët.

4. An hexameter with an Alcmanian dactylic tetrameter catalectic; as,

Laudabunt alii claram Rhöden, aut Metylenen,
Aut Ephesum, bimarisve Corinthi.—Hor.

5. An hexameter with an Alcmanian dactylic tetrameter catalectic; as,

O qui perpetuis orbem moderaris habenis
Placidos bonus exsere vultus.—Buchan. Psal. 68.

6. An hexameter with an iambic dimeter acatalectic; as,

Nox erat, et cœlo fulgebat luna sereno
Inter minora sidera.—Hor.

7. An hexameter with an iambic trimeter; as,

Altera jam teritur bellis civilibus ætas;
Suis et ipsa Roma viribus ruit.—Hor.

8. An hexameter with an Archilochian elegiambic asyn; as,

Horrida tempestas cœlum contraxit; et imbres
Nivesque deducunt Jovem: nunc mare, nunc silüæ.—Hor.

9. An Alcmanian dactylic trimeter hypercatalectic, with a Pherecratic dactylic trimeter acatalectic; as,

Omne hominum genus in terris
Simili surgit ab ortu.—Boët.

10. The Alcmanian dactylic tetrameter acatalectic, with an Archilochian dactylic dimeter hypercatalectic; as,

Quam thalamo, tædisque jugalibus
Invida mors rapuit.—Auson. Parent 2.

11. The Alcmanian dactylic tetrameter acatalectic, with n iambic dimeter acatalectic; as,

Sunt etenim pennæ volucres mihi
Quæ celsa conscendant poli.—Boët.

12. The Anacreontic iambic dimeter catalectic, with the Pherecratic dactylic trimeter acatalectic; as,

Quisquis volet perennem
Cantus ponere sedem.—Boët.

13. The

13. The iambic trimeter acatalectic, with the elegiac pentameter; as,

Quamvis fluente dives auri gurgite
Non expleturas cogat avarus opes.—Boët.

14. The iambic trimeter acatalectic, with the iambic dimeter acatalectic; as,

Ibis liburnis inter alta navium,
Amice, propugnacula.—Hor.

15. The iambic trimeter acatalectic, with the Archilochian elegiambic; as,

Petti, nihil me, ficut antea, juvat
Scribere verficulos, amore percuffum gravi.—Hor.

16. The fcazon iambic, with an iambic dimeter acatalectic; as,

Verona docti fyllabas amat vatis
Marone felix Mantua eft.—Martial.

17. The Euripidean trochaic dimeter catalectic, with an iambic dimeter acatalectic; as,

Orbis omnes incolæ
A fole Eoo ad Hefperum.—Buchan.

18. The Euripidean trochaic dimeter catalectic, with an Archilochian iambic trimeter catalectic; as,

Non ebur, neque aureum
Mea renidet in domo lacunar.—Hor.

19. The Alcmanian trochaic dimeter acatalectic, with a Pherecratic dactylic trimeter acatalectic; as,

Quos vides federe celfos
Solii culmine reges.—Boët.

20. The trochaic tetrameter catalectic, with an iambic trimeter acatalectic; as,

Ore pulchro, et ore muto, fcire vis quæ fim?
Imago Rufi rhetoris Pictavici.—Aufon.

21. The Sapphic pentameter acatalectic, with an iambic dimeter acatalectic; as,

Gentis humanæ pater atque cuftos
Quam fancta majeftas tui.—Buchan.

22. The Sapphic pentameter acatalectic, with the Glyconic choriambic trimeter acatalectic; as,

Cum polo Phœbus rofeis quadrigis
Lucem fpargere cæperit.—Boët.

23. The Phalæcian pentameter acatalectic, with an elegiac pentameter; as,

Quid tantos juvat excitare motus
Et propriâ fatum follicitare manu.—Boët.

24. The Phalæcian pentameter acatalectic, with an Alcaic dactylic tetrameter acatalectic; as,

Quamvis fe Tyrio fuperbus oftro
Comeret, et niveis lapillis.—Boët.

25. The Phalæcian pentameter acatalectic, with a Sapphic pentameter acatalectic; as,

Hic partus placidâ manens quiete,
Hoc patens unum miferis afylum.—Boët.

26. The Ariftophanian choriambic dimeter acatalectic, with an Alcaic epichoriambic tetrameter acatalectic; as,

Lydia dic per omnes
Te deos oro, Sybarin cur properes amando.—Hor.

27. The Glyconic choriambic trimeter acatalectic, with the Afclepiadic choriambic tetrameter acatalectic; as,

Sic te diva potens Cypri,
Sic fratres Helenæ lucida fidera.—Hor.

28. The Afclepiadic choriambic tetrameter acatalectic, with the Pherecratic dactylic trimeter acatalectic; as,

Si quantas rapidis flatibus incitus
Pontus verfat arenas.—Boët.

29. The Afclepiadic choriambic tetrameter acatalectic, with an iambic dimeter acatalectic; as,

Eheu, quæ miferos tramite devios
Abducit ignorantia.—Boët.

30. The dactylic-trochaic feptenarius, with an Archilochian iambic trimeter catalectic; as,

Solvitur acris hiems gratâ vice veris et Favoni,
Trahuntque ficcas machinæ carinas.—Hor.

31. The trochaic dactylic, with an iambic dactylic; as,

Si quis Arcturi fidera nefcit
Propinqua fummo cardine labi.—Boët.

II. *Of the Carmen Dicolon Triftrophon.*

1. Two Ariftophanian anapæftic tetrameters acatalectic, and an Adonic dimeter acatalectic; as,

Tu quoque in ævum, Crifpe, futurum
Mæfti venies commemoratus
Munere threni.—Aufon.

2. Two Alcmanian trochaic dimeters acatalectic, and an Euripidean trochaic dimeter catalectic; as,

Incolæ terrarum ab ortu
Solis ultimum ad cubile,
Eia Domino pfallite.—Buchan.

3. Two fmall Ionic trimeters acatalectic, and a fmall Ionic tetrameter acatalectic; as,

Miferarum eft, neque amore dare ludum
Neque dulci mala vino lavere; aut ex-
-animari metuentes patruæ verbera linguæ.—Hor.

III. *Of the Carmen Dicolon Tetraftrophon.*

1. Three Anacreontic trochaic dimeters acatalectic, and a choriambic trochaic quinarius; as,

Age cuncta nuptiali
Redimita vere tellus
Celebra toros heriles
Omne nemus cum fluviis, omne canat profundum.—Claud.

2. Three Sapphic pentameters, and an Adonic dimeter; as,

Jam fatis terris nivis, atque diræ
Grandinis mifit pater, et rubente
Dextera facras jaculatas arces
Terruit urbem.—Hor.

3. Three

3. Three Glyconic choriambic trimeters acatalectic, and a Pherecratic dactylic trimeter acatalectic; as,

> Dianæ fumus in fide
> Puellæ, et pueri integri:
> Dianam pueri integri,
> Puellæque canamus.—Catull.

4. Three Asclepiadic choriambics and a Glyconic; as,

> Aurum per medios ire fatellites,
> Et perrumpere amat faxa potentius
> Ictu fulmineo. Concidit auguris
> Argivi domus ob lucrum.—*Hor.*

IV. Of the Carmen Tricolon Triftrophon.

1. An hexameter, an Archilochian dactylic dimeter hypercatalectic, and an Iambic dimeter acatalectic; as,

> Te regem Dominumque canam, dum lucida volvet
> Lucidus aftro polus,
> Et unicum colum Deum.—Buchan.

2. An hexameter, an Iambic dimeter acatalectic, and an Archilochian dactylic penthemimer; as,

> Horrida tempeftas cœlum contraxit; et imbres
> Nivefque deducunt Jovem:
> Nunc *mare*, nunc filüæ Epod. 13.

Thus Heinfius fcans the 13th Epod.

3. An Iambic trimeter acatalectic, an Archilochian dactylic penthemimer, with an Iambic dimeter acatalectic; as,

> Petti, nihil me, ficut antea juvat
> Scribere verficulos—
> Amore percuffum gravi.—Hor.

But others term this a carmen dicolon diftrophon.

4. A Glyconic choriambic trimeter, an Afclepiadic choriambic tetrameter, and an Alcaic choriambic pentameter; as,

> Per quinquennia jam decem
> Ni fallor, fuimus; feptimus infuper
> Anno cardo rotat, dum fruimur Sole volubili.—Prudent.

V. Of the Carmen Tricolon Tetraftrophon.

1. Two great alcaics, an Iambic dimeter hypercatalectic, and a fmall alcaic; as,

> Odi profanum vulgus et arceo:
> Favete linguis: carmina non prius
> Audita, Mufarum facerdos,
> Virginibus puerifque canto.—Hor.

2. Two Afclepiadic choriambics, a Pherecratic dactylic trimeter, and a Glyconic choriambic; as,

> Prima nocte domum claude, neque in vias
> Sub cantu querulæ defpice tibiæ:
> Et te fæpe vocanti
> Duram, difficilis mane.—Hor.

There is likewife a third kind formed by a certain arrangement of ode 12. lib. 3. of Horace; for which fee the Carmen Diocolon Triftrophon, No. III.

As the literature of Italy and France is allowed to hold fuch diftinguifhed rank and importance in the republic of letters, it is now incumbent on us to offer fuch remarks as may tend to develope the nature and principles of

Italian and French Verfification.

I. If the reader will take the trouble to confult the abbé d'Olivet on the French Language, (edit. of 1807, p. 6—10.) he will find a detail of thofe who attempted the compofition of verfe after the principles of the ancient Greeks and Romans. This practice, however, has long fince become quite obfolete, and fyllabic quantity has been fuperfeded, in the ftructure of verfe, by accentuation, and therefore the definition of modern verfe may be given in the following words.

II. A verfe is an affemblage of fuch a definite number of fyllables or feet, and comprifes fuch a feries of regularly recurring accents, as may be eafily remarked by the ear; whofe pleafing fucceffion is regulated by our innate perception of what is mufical and harmonious; and it, therefore, admirably ferves to delight the ear, to expand the foul, to folace the heart, to aid the memory, and to adapt the language of difcourfe to that of fong and mufic.

The extent or the meafure of verfe ought to be fuch, that it may be eafily and fenfibly felt by the ear; otherwife verfe differs not from profe. For if the number of feet or fyllables conftituting the verfe be fuch, as to prevent the eafy recognifance of the fame returning feries, the ear fails to be delighted, or the memory to be affifted by the recurrence of what it is only fatigue or difficulty to anticipate.

That an intimate analogy exifts between verfe and mufic is manifeft to the moft fuperficial obferver. They receive their exiftence from the fame laws, and their object is to gratify and delight the fame organ. Amongft the ancients, mufic lent its numbers to poetry. It was to the lyre that Apollo, Orpheus, and Homer fung their verfe. "Illud quidem certum," fays Voffius, "omnem poefim olim cantatum fuiffe." It is, therefore, to mufic that we muft refer for the bafis, the rationale, of verfification.

It is affirmed too, by the definition juft given, that verfe admirably ferves to delight the ear, to expand the foul, and to aid the memory. Verfe aims to render the truths and fentiments expreffed by its language, amiable and interefting. And this it effects by the medium of an accurately meafured and agreeable fucceffion of accented and unaccented founds, which addrefs the ear; and by the means of fuch images and fentiments as delight and affect the foul: and the memory is powerfully affifted as well by the one as by the other.

III. To explain the nature of Italian verfe, it is neceffary to remark, that they divide all the words contained in their language into three claffes, termed words *tronchi*, *piani*, and *sdruccioli*. Words having the accent on the laft fyllable are called *tronchi;* as bontà, virtù, fà, fentì. Thofe having the accent on the penultimate are termed *piani;* as uómo, animále, impéro, &c. And thofe that are accented on the antepenultimate are named *fdruccioli;* as dócile, ábito, áncora, &c. The firft are denominated *tronchi*, (*tronqués coupés, cut fhort,*) becaufe they were originally entire, as bontàde, virtute, face, fentis. The fecond clafs, *piani*, receives this diftinction from the circumftance of the words compofing it being pronounced (*pianamente*) more gently than thofe of the other two claffes; and the laft, the *fdruccioli* (*coulans* or *gliffons*), becaufe the words of this kind feem to flow or flide fwiftly from the antepenultimate fyllable to the end.

IV. Hence alfo it follows, that a verfe alfo receives its denomination, according as it is terminated by a word of one or the other of thefe kinds: confequently, verfes termed tronchi are terminated by an acute accent; thofe called piani

piani have a ſyllable after this accent; and the ſdruccioli have two; to which ſome add the più che ſdruccioli, which have four ſyllables after the accent.

The laſt accent decides the nature and the completion of every verſe. The ear meaſures the extent of a verſe from its commencement to the laſt accent. The ear is naturally ſenſible at the occurrence of this laſt accent, that the harmony of the verſe is accompliſhed: it is ſatisfied, and demands nothing more. It is equal, whether the laſt accentuated ſyllable be itſelf the laſt ſyllable, or followed by one, two, or four ſyllables; for the meaſure of the verſe is compriſed between its commencement and this laſt accentuated ſyllable. The ſyllables remaining after this accent are redundant, with reſpect to the meaſure and harmony of the verſe. (See Ariſtotle, Poet. cap. 8.) This conſideration will render it evident, that if a verſe be piano, (which ſpecies the Italians ſelect for their regular meaſure,) it will have the preciſe number of ſyllables which the nature of the verſe aſſigns to it; if it be tronco, it will have one leſs; if ſdrucciolo, one more. Therefore, the verſe piano is acatalectic; the verſe tronco, catalectic; the verſe ſdrucciolo, hypercatalectic.

V. The French in a ſimilar manner divide their words chiefly into two claſſes, the maſculine and the feminine. The maſculine (correſponding to thoſe which the Italians term *tronchi*) have the accent on the laſt ſyllable; as vertú, nouveaú, il parlá, and are generally of the maſculine gender. The feminine (analogous to the Italian *piani*) have the accent on the penultimate; as honnête, ils parlèrent, il párle, Fránce, &c.: and theſe are ſo called, becauſe that nouns of this deſcription are generally terminated by the *e* mute, a characteriſtic of the feminine gender. The words called ſdruccioli by the Italians (gliſſant by the French) can only be found in ſuch phraſes as gárde-le, dítes-le, móntre-le, &c.

The ſame epithets are alſo applied to their verſe, according to the characteriſtic of the word which terminates it.

Theſe preliminary obſervations, well underſtood, will reconcile the anomalies which, until the preſent, have produced an apparent difference between the nature of the Italian and that of the French verſification. For ſince the Italians ſelect the verſe piano for their common meaſure, and the French the maſculine (or tronco), which, between the commencement of the verſe and the accented ſyllable, will contain one ſyllable leſs than the former; it follows that the Italian verſe will always exceed the French verſe of the ſame kind by one ſyllable. For example, the Italian hendecaſyllable piano has eleven ſyllables, and the French hendecaſyllable maſculine (tronco) ten; and the French hendecaſyllable piano will have the ſame, for they do not reckon, as the Italians, the redundant ſyllable.

The only ſimple feet admitted in the compoſition of French and Italian verſe are the trochee, the iamb, the dactyl, and the anapæſt. It is unneceſſary to repeat here the definition we have already given of a metre and a rhythm, in a former part of this article. We ſhall, therefore, now proceed to ſtate all the poſſible combinations that can reſult from theſe four feet in the compoſition of a hemiſtich, which is, by a late French writer, conſidered as a ſimple or primitive verſe.

An iambic hemiſtich may conſiſt of three, four, or five feet; ſo may the trochaic, the anapæſtic, or the dactylic hemiſtich: therefore, from hence we have twelve varieties, or all the poſſible combinations of the hemiſtich. For each of the four feet cannot produce more than three varieties, the ſmalleſt of which cannot conſiſt of leſs than three, nor the greateſt of more than five feet. Hence, then, we have at once the *minimum* and *maximum* of their extent. At the former, we aſſert that an hemiſtich cannot conſiſt of leſs than three feet. We have already remarked, that the extent or meaſure of a verſe ought to be ſuch as to admit of its being eaſily and ſenſibly remarked by the ear, otherwiſe it is not verſe, but proſe. And every verſe or hemiſtich contains more or leſs of the rhythmical order; and, as we have already obſerved, a rhythm is a ſeries of ſimilar feet continued until the ear perceives the order of the ſeries, and is able to anticipate the peculiar nature and recurrence of the verſe. But one foot cannot be a ſeries, therefore a foot cannot be a hemiſtich. We have already affirmed, too, that the ſucceſſion of two ſimilar feet conſtitute a metre; and a metre is the commencement of a ſeries. But the commencement of a ſeries is not the ſeries itſelf: the ſeries ſuppoſes a continuation; therefore, the ſucceſſion of two feet, or a metre, cannot be a hemiſtich or primitive verſe. For the union of two feet form a metre; but a metre is not a rhythm; therefore, two feet are not a hemiſtich. But if to two ſimilar feet ſucceed another of the ſame nature, then the ſeries is decided. An hemiſtich, then, cannot have leſs than three feet. What is ſmaller than this is only the element of an hemiſtich. Let us further inquire, in what conſiſts the harmony of a verſe? Doubtleſs in the regular order of the accents in its rhythm or ſeries. But one foot has only one accent; therefore, it has no harmony, and cannot be an hemiſtich or radical verſe. So we reply concerning two feet; they are not an order or ſeries, but only the commencement of a ſeries. We may, with M. J. J. Sulzer, illuſtrate theſe remarks by repeating the following ſeries, *un deux, un deux, un deux, un deux, un deux,* &c. Here we can eaſily perceive the rhythmical order. But no one can ſuppoſe that the firſt foot, *un deux*, is an order or ſeries; nor in the firſt two feet, *un deux, un deux*, do we perceive more than the commencement of a ſeries. But if we include the third, *un deux, un deux, un deux*, we ſee at once the order, the ſeries, the rhythm, and, laſtly, the metrical hemiſtich preciſely decided. Three feet, then, is the ſmalleſt number which can conſtitute the hemiſtich or primitive verſe.

In the ſame manner we may determine the maximum of the hemiſtich. We have ſaid that it cannot exceed five feet; for the number muſt be ſuch as may be diſtinctly remarked by the ear. Suppoſe, for example, an hemiſtich of ſix feet; ſince it may be divided into two equal parts of three feet each, and ſince three feet form an hemiſtich, it is evident that the line of ſix feet is not one but two hemiſtichs, *i. e.* a verſe. But the hemiſtich of five feet is incapable of being thus divided. If it be, let the one part conſiſt of three feet, which, as we have juſt proved, is an hemiſtich; the other of two feet, which is only a metre; and a metre, as we have juſt obſerved, is not an hemiſtich; conſequently, the line of five feet is an hemiſtich or primitive verſe. And becauſe a verſe of ſix feet is compoſed of two hemiſtichs, the line of five feet is the maximum or greateſt hemiſtich or primitive verſe; and lines conſiſting of more than this, after the redundant ſyllables are cut off, contain two or more hemiſtichs of a verſe.

VI. Some writers on verſification are in the habit, however, of treating on verſe, which they term diſyllabic, triſyllabic, quadriſyllabic, the quinarius, and the ſenarius. But theſe are not verſes, but only the elements of a regular and complete verſe. We ſhall, however, in conformity to their cuſtom, and to omit nothing eſſential, eſpecially in what muſt be admitted to form the baſis of this art, proceed to treat on the elements here enumerated.

1. The diſyllabic member cannot have more than one accent.

cent. If it is tronco, it has but one ſyllable (ſee obſ. 3. and 4, ſupra); if piano, two; if ſdrucciolo, three; as,

Tronco - - -	Là.
Piano - - -	Láſſo!
Sdrucciolo - - -	Pénſaci.

2. The triſyllabic member, if it has but one word, has only one accent; if it conſiſt of two words, it has two accents. If it is tronco, it has only two ſyllables; if piano, three; if ſdrucciolo, four; as,

Tronco - - -	Potrà
	Chi fù [2].
Piano - - -	Potránne
	Si díſſe.
Sdrucciolo - - -	Riſvégliati [4]
	No, díſſero [4].

3. The quadriſyllabic member tronco has only three ſyllables; piano, four; ſdrucciolo, five; as,

Tronco - - -	Io men vò [3].
Piano - - -	Belle róſe [4]
	Porporíne [4].
Sdrucciolo - - -	I di vòlano [5].

We may here remark, that the Italians call that the accent (*commun*), which is placed at the end of each verſe, and which accompliſhes the meaſure of the ſame. They aſſign this epithet to it, in conſequence of its being eſſential and *common* to all verſe. And this accent is placed on the laſt ſyllable, if the verſe is tronco; on the penultimate, if piano; on the antepenultimate, if ſdrucciolo. Now, in the above quadriſyllabics, we may obſerve that this accent uniformly falls on the third ſyllable.

3. The quinarius, beſides the common accent, has alſo an accent on the ſecond ſyllable, ſometimes on the firſt, and not unfrequently it has only the common accent. It contains four, five, or ſix ſyllables, according to the laws already preſcribed; as,

Tronco - -	Porgilo a mè [4].
Piano - -	Terſi deh ſòrgi [5].
Sdrucciolo - -	Ah non ti pèrdere [6].

The diſyllabic member, when it is tronco, does not contain even the image of a foot; but if it is piano, it is a trochee, as lāſſŏ; and if it is ſdrucciolo, it is a dactyl, as pēnſăcĭ. The triſyllabic, of whatever kind it be, can have only an iamb, as pŏtrā, pŏtrānne, rĭſcēgliati. Example:

Sĕ cērca,	S' io vo'
* Se dice:	" Colla ſorte
L'amico	Cangiando
Dov' e	Sembianza;
L'amico	Virtu
" Infelice	" L'incoſtanza
Riſpondi	Diventa
Mori	Per me, &c.—Metaſt.

The quadriſyllabic is a monometer, conſiſting of two trochees, which form a metre; and two of theſe united form the regular octonarius.

1. Dāmĭgēllă
Tutta bella,
Verſa verſa — quel bel vino
Fa che cada
La ruggiada
Diſtillata — di rubino.

2. O' nel ſeno
Rio veneno
Che viſparſe
Amor profundo,
Ma gittarlo
E laſciarlo
Vo' ſommerſo in-
queſto fondo.

The quinarius is an iambic monometer, and conſequently not a rhythm. Example:

Oh quānto e facile	Si ſcuote il laccio,
Nella catena	Ma non ſi ſpezza,
D'amor languir!	E amor ſi vendica
Quanto e difficile	Con piu fierezza
Poterne uſcir!	Del folle ardir.—Zeno.

VII. Every ſpecies of French verſe is the ſame as the Italian. In each we diſcover the ſame number of ſyllables, the ſame accents, the ſame cæſura, the ſame feet, the ſame harmony. To evince this, we ſhall now ſtate, in the ſame order as we have done for the Italian verſe, the following elements or members of a verſe.

1. The diſyllabic	Tronco -	Ēſt.
	Piano -	Ētrĕ.
		Dōnnĕ.
	Sdrucciolo	Dōnnĕ-le.
2. The triſyllabic	Tronco -	Sĕrā [2].
	Piano -	Fācĭle [3].
	Sdrucciolo	Rĕgārde-lĕ [4].
3. Quadriſyllabic	Tronco -	Cōmbăttēz [3].
	Piano -	Cōnsĭdērĕ [4].
	Sdrucciolo	Cōnsĭdērĕ-le [5].

VIII. *The Senarius.*

The ſenarius is an anapæſtic monometer catalectic, having only an iamb for the firſt foot. Beſides the accent *common*, (which is on the fifth ſyllable,) it generally requires an accent on the ſecond ſyllable; though ſometimes the accented ſyllables are the firſt, third, and fifth. It contains five, ſix, or ſeven ſyllables, according as the verſe is tronco, piano, or ſdrucciolo; as,

Tronco -	Uſáte pietà [5].
Piano -	Begli àſtri d'amòre [6].
Sdrucciolo	Dà quì tu quel càlice [7].

The French, according to the rule which we have already explained, call this verſe of five ſyllables. The difference is merely nominal: the verſes are virtually the ſame.

Tronco -	Toŭjoūrs cĕ zĕphir.
Piano -	L'ămōur ă dĕs chārmes.
Sdrucciolo	(no example exiſts).

IX. *The Septenarius.*

If to each of the monometers, of which we have juſt treated, we add one, two, or three other feet, theſe monometers become, according to the principles we have preſcribed, regular and legitimate verſe.

The ſeptenarius is compoſed of iambic feet, and contains ſix, ſeven, or eight ſyllables, according as the verſe is tronco, piano, or ſdrucciolo; as,

Tronco -	Che vino è quél colà [6]?
Piano -	In un gravóſo affanno [7].
Sdrucciolo	O liquor dólce e amábile [8].

This verſe, beſides the *common* accent, which conſtantly falls

falls on the sixth syllable, requires an accent on the fourth. Often it has the accent on the second and fourth, and then the verse is exceedingly harmonious. It is stated, however, to be a peculiar conveniency of this verse, that it does not *absolutely* require any other accent than the accent common; but since the regular septenarius consists of three iambic feet, we discover the evident reason that it should have the acute accent on the second, the fourth, and sixth; as,

$$\smile \overset{2}{-} \smile \overset{4}{-} \smile \overset{6}{-}$$

This verse is of extraordinary antiquity in Italian versification, as appears from the verse of Messer Ruggeri, quoted by Trissino.

The French, who, as we have often remarked, measure their verse by the masculine (tronco), call the septenarius of six syllables. In reality it is only three iambic feet, the seventh syllable is redundant. With regard to the accents, it is subject to the same laws as the Italian septenarius.

Tronco - A soi-même odieux [6].

Piano - Le sot de tout s'irrite.

X. *The Alexandrine Verse.*

Two septenarian verses united, form what the Italians call an Alexandrine or Martellian verse.

These verses, called by the Italians Alessandrini, are an imitation of the French Alexandrine, which the French themselves, as Fauchet and Pasquier observe, have derived from an ancient rhapsody which celebrated the life of Alexander the Great. The Italians, however, also call them Martelliani, from James Martelli, a learned and ingenious author, who, in the composition of his tragic verse, successfully imitated the French Alexandrine.

Although this verse consists of fourteen syllables, it is not absolutely necessary to divide it into two exact sevens, with all the rules which are essential to each septenary. The rhythm is iambic to the end of the verse. But in proportion as we neglect the accents, the verse becomes more grave and majestic, and more free and harmonious in proportion as we pay strict attention to the rules prescribed for the septenarius.

There is not a literary Italian that is not perfectly aware that the Italian and French Alexandrine are the same. The most insensible ear may perceive the same percussion of the accent, the same number, the same harmony.

This verse, according to the different position of the accent, preserves in French as well as in Italian a character of dignity which equals the Latin hexameter. And the French have made choice of the Alexandrine to treat on epic and tragic subjects. Neither were they dissuaded from this because this verse was stigmatized by the epithet "*commun*," in consequence of the shepherds, the vintagers, and husbandmen having availed themselves of its peculiar facilities for their poetic effusions.

XI. *Octonarius.*

The octonarius consists of four trochaic feet. Besides the common accent, which is uniformly on the seventh syllable, it requires the accent on the third. But if the accent should fall both on the third and fifth, still more if on the first, third, and fifth, the harmony will become more sensible.

Tronco - Viva Bacco il nostro re.

Piano - Musa, amor portò novella.

Sdrucciolo L'acqua agghiaccia i corpi, e gli animi.

Loretto Mattei quotes some verses from Rospigliosi, accentuated on the second syllable; but this kind of verse has few admirers; it is scarcely discernible from prose.

The octonarius is generally employed for lyric poems, and airs adapted to music, and for the *canzonette*. But it is every where distinguished by that characteristic of gravity which renders it equally adapted to sublime and elevated subjects.

Since the octonarius contains two monometers of four syllables each, (see the quadrisyllabic member,) it may very properly be divided by the cæsura into two equal parts.

This verse amongst the French, for the reason already assigned, is said to be of seven syllables. It is subject to the same laws of accentuation as the Italian. The accent, however, on the fifth, amongst the French, is sometimes omitted, but never that on the third.

Tronco - Belle nymphe tes attraits.

Que langueurs, que soins jaloux.

Piano - Viens m'aider a fuir les vices.

XII. *Novenarius.*

Some are of opinion that the Italian novenarius does not possess sufficient harmony for poetic composition. And l'Abb. Quadrio declares that this species of verse ought not to be admitted in Italian poetry. On the other hand, Joseph Gaétan Salvatori affirms that verse of this kind is by no means defective in point of harmony; and many poets of distinguished rank have employed this species of rhythm with success. Example:

Tronco - Certo che vinto a morte andrò [8].
Piano - Tormento crudele tiranno [9].
Sdrucciolo Vedi, vedi come sen fuggono [10].

This verse, as it respects the accent, is subdivided into four varieties. The first, besides the common accent, has the accent on the third and on the fifth syllable.

The celebrated Sacchi is inclined to suppose that this kind of verse is composed of two iambic quinarii, of which the former is acephalous, so as to give nine syllables in all.

The second variety has the accent on the third and sixth syllables.

The third variety has, besides that accent which is *common* to every species, the fourth syllable only accentuated.

This variety is an iambic dimeter hypercatalectic. It consists of two quinarii, of which the first is tronco: or if it is piano, it is subject to the elision consequent on the following hemistich beginning with a vowel. It admits also the accent on the second and sixth syllables, as well as on the fourth; and then the rhythm becomes purely iambic, and the harmony more complete.

The fourth variety, besides the common accent, has the second and fifth syllables accentuated.

This variety is an anapæstic trimeter, having the first foot supplied by an iamb.

XIII. *The Decasyllabic Verse.*

The decasyllabic sometimes consists of two quinarii, which form a cæsura at the point of their union.

Since this verse is composed of two quinarii, it is necessarily subject to the same laws. See § VI. 3.

Sometimes it is not composed of two quinarii, nor has it any regular cæsura.

This species of verse is anapæstic trimeter, either cata-lectic,

lectic, acatalectic, or hypercatalectic, according as it is tronco, piano, or sdrucciolo; as,

Tronco - Contra morte non val fresca età.

Piano - Vasto incendio se bolle ristretto.

Sdrucciolo I bon vini son quelli che acquietano.

There is another variety of the decasyllabic verse, of which Chiabrera has given us an example. It has the accent on the first, the third, the fifth, the seventh, and on the ninth syllables.

The rhythm of this verse is essentially different from either of the preceding; it consists of five trochaic feet.

XIV. *The Hendecasyllabic Verse.*

The hendecasyllabic verse is also called *heroic;* for it is that rhythm* which, from its harmony, its grave and majestic movement, and the variety of which it is susceptible, offers to the poet peculiar advantages for the expression of sublime and elevated subjects. It is, in common with every other, capable of three kinds; as,

Tronco - Monte-pulciano d'ogni vino è ib re[10].
Piano - T'Alzò natura in verso al ciel la fronte[11].
Sdrucciolo Celebri l'acqua, e se la bea pur Pindaro[12].
Redit

Tronco - Le printems fuit, hâtons-nous d'être heureux.

Piano - Qui n'en ferait en effet idolatre.—Petr.

This verse is generally accented on the second, the fourth, the sixth, the eighth, and on the tenth syllable, which last is the accent common, or invariable.

And the verse thus accentuated is the most harmonious: but as an unvaried recurrence of the same luxuriant rhythm would become eventually monotonous, it admits of the following varieties.

1. It is sufficient, if, besides the common accent, the sixth syllable should be accented.

2. The second variety has, independently of the common accent, the fourth and eighth syllables only accented.

3. The third variety, besides the common accent, has only the fourth and the seventh syllables accented.

With regard to the *apparent* difference in the number of syllables between the Italian and French hendecasyllable, the reader is referred to what has been already observed at § V.

Concerning the Intermixture of different Verse.—Whatever harmony may arise from the succession of verses of the same kind, they often acquire a new excellency when the series is composed of an *appropriate* admixture of verse of a different rhyme.

It may now be reasonably inquired, why is the intermixture of different verse productive, at one time, of an agreeable effect, and at another of the contrary? In answer to this inquiry it is here only necessary to remark, that we have already said that the hendecasyllabic verse and the septenarius, together with the two members of which the hendecasyllable is composed, the septenarius and the quinarius, are of the iambic rhythm. Hence we clearly perceive, that the transition from the hendecasyllable to the septenarius, and *vice versâ*, from the latter to the former, preserves the same rhythmical order and movement. And the same principle will sanction the intermixture of an octonarius and a quadrisyllabic verse, since the rhythm of each is trochaic. It often happens however, that notwithstanding the exact identity of the rhythm in the alternation of different verses, the effect is not agreeable. But this only happens when we connect verses, for example, of four feet, with others of five or three feet. And here it is evident, that although a verse of five feet and another of four are of the same rhythm, yet they present an essential difference. The verse of five feet is indivisible, but that of four feet, which is an even number, may be divided into two equal parts, which are in rhythmical quantity perfectly equivalent and reciprocal to each other. The impression, therefore, resulting from this verse, is different from that of the verse which can only present to the ear the rhythm of two unequal parts. And here we may add, once for all, that all which we have said concerning the combination of verse of the same or of different kinds in the Italian language, is perfectly applicable to that of the French also.

I. *Of the Sonnet.*

The regular sonnet contains fourteen hendecasyllabic verses, divided by the rhythm into four stanzas, or strophes, of which two are tetrastrophons, and two tristrophons.

The sonnet, which the Italians call '*colla coda*, '*caudato*,' receives this appellation from the circumstance of its having, after the fourteenth verse, a train of one or more stanzas of three verses each, or tristrophons. The fifteenth verse must in this case be a septenarius, and rhyme with the fourteenth.

Sonnets may be also composed of the verse octonarius, septenarius, or quinarius.

The two rhymes of the tetrastrophon stanza are susceptible of four different combinations, according to the following table. Any of which, but legitimately no other, the poet may adopt freely at his choice.

1st. Tetrastrophon: rhyme closed (*ferée*).

1 - -	ano	5 - -	ano	most in use.
2 - -	ore	6 - -	ore	
3 - -	ore	7 - -	ore	
4 - -	ano	8 - -	ano	

2d. Tetrastrophon: rhyme alternate.

1 - -	asto	5 - -	asto
2 - -	era	6 - -	era
3 - -	asto	7 - -	asto
4 - -	era	8 - -	era

3d. Tetrastrophon: rhyme reciprocally alternate.

1 - -	idi	5 - -	ezzo
2 - -	ezzo	6 - -	idi
3 - -	idi	7 - -	ezzo
4 - -	ezzo	8 - -	idi

4th. Tetrastrophon: rhyme alternate and closed.

1 - -	ente	5 - -	eme
2 - -	eme	6 - -	ente
3 - -	ente	7 - -	ente
4 - -	eme	8 - -	eme

The rhyme of the tristrophon may have, at the option of the poet, the following varieties.

1st. Tristrophon: rhyme connected (*enchainée*).

1 - -	ice	4 - -	ante	most in use.
2 - -	ante	5 - -	ice	
3 - -	ice	6 - -	ante	

2d. Tris-

* *Rhythm* and *rhyme* are two distinct things: the former is defined in the preceding pages of this article, it is derived from 'ρυθμος; the latter is only the correspondence of the last sound of one verse, to the last sound of the next. And on account of this material distinction, not generally understood, *even by English lexicographers*, the recent writers on this subject thus orthographically distinguish the former,—rhythm.

2d. Tristrophon: rhyme tertian (*atterzata*).

1 - -	etto	4 - -	etto
2 - -	ente	5 - -	ente
3 - -	ogno	6 - -	ogno

Or,

1 - -	etto	4 - -	ente
2 - -	ente	5 - -	etto
3 - -	ogno	6 - -	ogno

3d. Tristrophon: rhyme duplex.

1 - -	ate	4 - -	oria	seldom used.
2 - -	oria	5 - -	ate	
3 - -	oria	6 - -	ate	

There is no essential difference between the Italian and French sonnet. In addition, however, to the above, they also employ the following rhymes.

4th. Tristrophon: rhyme tertian (à la manière Français).

1 - -	use	4 - -	eme
2 - -	use	5 - -	eme
3 - -	net	6 - -	net

Or,

1 - -	eux	4 - -	crit
2 - -	eux	5 - -	erre
3 - -	erre	6 - -	crit

We may, in the reading of poets, discover other methods; but every series differing from the above, is pronounced, by the connoisseurs, to be not "*ad unguem.*"

II. *Of the Ode.—Canzone, or Chanson.*

The ode is a composition formed of an indefinite number of stanzas, which, with respect to the rhyme and the measure of the verse, are uniformly the same to the conclusion of the poem. We may except, however, those concluding stanzas which have been called congé (congedo, or commiato), as if the poet, by this concluding strophe, shorter than the rest, took his *leave* of the poem, or person to whom it is addressed. Our limits will not admit of examples.

III. *Of the Canzonetta.*

The canzonetta (chansonette, or the Anacreontic ode) is an imitation of the characteristic, the simplicity, and the artless style of the odes of Anacreon. Of this species of composition, the celebrated Tasso was the inventor; but the praise is due to Chiabrera for that acmè of perfection to which he has advanced it.

The canzonetta differs from the ode in the following particulars.

1. Generally, though not always, the stanzas of which they are composed are less, and contain a smaller number of verses.

2. The stanzas consist of small verses of different kinds.

3. They are not adapted to that elevated and sublime style which the ode requires. The characteristic of their style should be simple, artless, and familiar; and they are, therefore, very well suited to what is of an agreeable and humourous nature, to fables, and to allegories, of which the sense or moral is usually given at the close.

The number of stanzas of which the canzonetta consists is indefinite, at the discretion of the poet. The strophes are usually composed of four or six verses, in their measure either mixed or uniform, but always agreeing together by the *closed* or *alternate* rhyme. (*Rime ferrée ou alternée.*) See the table of rhyme under the *Sonnet.* Sometimes the stanzas contain ten verses, and then, as well as when they have six verses, the two first and the two last should rhyme together.

When the strophe contains verses tronchi, piani, and sdruccioli, we may perceive a disagreement in the rhyme. But of whatever nature the first stanza may be, the subsequent stanzas should strictly conform thereto. In lyric poems, on the contrary, we are at liberty to vary the stanza, *pro re natâ*, as circumstances and the taste and discretion of the poet may require.

IV. *The Sapphic Ode.*

This ode, of which the Grecian poetess Sappho was the inventress, is, when regular, composed of several tetrastrophons, of which the three first verses are hendecasyllabic, the last a quinarius. Frequently, however, the septenarius is substituted for the quinarius; in which case the strophe has less elegance, and less conformity to the Grecian original, of which they should be an exact imitation. The rhyme most employed is the *alternate* or the *closed* (*alternée* or *ferrée*).

Among the several forms of the French ode, the following is much admired. The reader must be content with a single stanza for illustration; our limits forbid more.

Puissantes Déités, qui peupler cette rive,
  Prêparer, leur dirais-je, une oreille attentive
    Au bruit de mes concerts.
  Puissent-ils amollir vos superbes courages
  En faveur d'un Héros digne des premiers âges
    Du naissent Univers!—Rousseau.

We are compelled, for want of appropriate epithets, to borrow the following terms with which the Italians and the French denominate certain strophes of their composition.

Terza Rima.—This species of composition contains several tristrophons, each consisting of three hendecasyllabic verses. The rhyme is connected together in such a manner, that the first verse of each stanza agrees with the third, and the second rhymes with the first and the third of the stanza following. And this order is preserved to the end.

There is no example of this species of composition in the French language, for, by a transposition of the verses, they convert the tristrophon into the tetrastrophon, and then call the terza rima the

Quarta Rima.—By the quarta rima, that species of poem is denominated which contains several tetrastrophons, of which each verse is an hendecasyllabic in Italian, and an Alexandrine in French: the rhyme is either *ferrée* or *alternée.* See table of rhyme under *Sonnet*, supra.

Sesta Rima et Ottava Rima.—Compositions of this kind receive their name from the number of verses of which their stanzas are composed; the former of six, the latter of eight. The two last verses agree together in rhyme (*plate*) *i.e. unmixed;* the rest in rhyme (*alternée*) *alternate;* see table, supra.

The French do not adhere to any regular standard in the composition of the *sesta rima,* which they call *les sixains, ou les stances de six vers.*

But with regard to the "*Ottava rima*" of the Italians, and the "*Stances de huit vers*" of the French, there is, both as it respects the rhyme and the nature of the verse, which in either case is hendecasyllabic, a perfect similarity. This species of composition has prevailed much since the time of Thibaut, who lived a hundred years before Boccace.

V. *The Madrigal and the Epigram.*

The madrigal is a small poem consisting generally of not less than six nor more than twelve verses, which are either octonarii, or more commonly septenarii or hendecasyllabic.

The

The number of verſes, however, of which the madrigal conſiſted, was amongſt the poets of the ſixteenth century arbitrary. The rhyme is yet *ad libitum;* ſometimes only the two laſt verſes rhyme together.

The character of the madrigal is not eſſentially different from the epigram of the Latins. It is contradiſtinguiſhed, however, by its ſtyle, which, though ſimple, is ſo elevated as to become equally unadapted to the ſatire, or to humourous and trivial ſubjects.

The epigram is a ſmall poem conſiſting of an indefinite number and kind of verſes, and terminating in a point of wit. Generally, however, it contains not leſs than two nor more than eight verſes, which are frequently hendecaſyllabic, and rhyme together by couplets.

VI. *The Dithyramb.*

The dithyramb is a ſpecies of poem compoſed in honour of Bacchus: or, in fact, it is any poem written with a degree of unuſual wildneſs and enthuſiaſm. It employs verſe of every kind, piano, tronco, ſdrucciolo, great and ſmall, with or without rhyme, and ſtanzas of any magnitude. And the whole is written with that liberty and freedom from reſtraint, as indicates it to be the indigenous production of the devotee of Bacchus. Its ſtyle at one time is elevated, at another low. The metaphors it employs are bold; its phraſeology excentric and whimſical, and words are admitted either purely exotic, or oddly compounded of others; as ebrifeſtoſo, egidarmato, capribarbicornipede, &c. The reader will find many examples of the Italian dithyrambic in the works of Creſcimbeni, Quadrio, and Andrucci, and in the "Bacco in Toſcana" of Franceſco Redi.

VII. *The Idyl.*

This ſpecies of poem conſiſts of an indefinite number of ſeptenarii or hendecaſyllabic verſes, and free from all reſtraint as it reſpects the rhyme. The word idyl (idillio) is derived from εἰδύλλιον, the diminutive of εἶδος, a figure or repreſentation; and the idyl, in fact, is nothing but the painting or image of ſome natural object.

There is no difference between the Italian and the French idyl.

The Cæſura.

We have now to notice what is peculiar to the cæſura in the French and Italian verſification. Amongſt the moderns, it is ſaid to be that pauſe between one word and another, which divides the verſe into two equal or unequal parts. A verſe is ſaid to be ſo much the more harmonious, in proportion as it abounds in cæſuræ which give redoubled energy to the accented ſyllables. The uſe and deſign of this pauſe, Boileau very appoſitely mentions in the following lines.

> Que toujours dans vos vers,—les ſens coupant les mots,
> Suſpende l'hemiſtiche,—en marque le repos.

In the hendecaſyllabic verſe, the cæſura ſhould occur between the fifth and ſixth ſyllable, and between the ninth and the tenth, or between the ſeventh and the eighth only; as in the following verſes of Arioſto.

> Il collo è tondo-il petto colmo-e largo.
>
> Da render molle-ogni cor rozzo, -e ſcabro
>
> Quindi eſcon le carteſi-parolette.

By adverting to the principles of accentuation already explained, we ſhall diſcover that when the hendecaſyllabic is accented on the fourth and eighth ſyllables, it ought to have the cæſural pauſe between the fifth and the fixth, and between the ninth and the tenth ſyllables. And when the principal accent is on the ſixth only, it ought to have the cæſura between the ſeventh and the eighth ſyllables; *i. e.* when the verſe is *piano.* But if the words on which the principal accents fall (*i. e. accent commun*) are *tronchi*, the cæſura muſt follow immediately after each accented ſyllable.

We may, from theſe obſervations, eaſily infer what are the moſt ſuitable places for the cæſura in every other verſe; as the cæſura ought to take place immediately after the principal or characteriſtic accent (*accent commun*) of the entire verſe, the hemiſtich, or of any conſtituent member.

To the above remarks, which are perfectly applicable to the verſification of the French language, we may add the following. If at the place of the cæſura, the preceding word be feminine, (*i. e.* end with *e* mute,) the following word ought to commence with an initial vowel, in order that the eliſion or ſynalæpha may take place. For example, in the hendecaſyllabic verſe, which conſiſts of a quinarius and a ſeptenarius, when the former ends with an *e* mute, the latter muſt commence with a vowel; otherwiſe the verſe will have a ſyllable too much, ſince a quinarius and a ſeptenarius conjointly make twelve ſyllables.

Engliſh Verſification.

All the different feet uſed in Engliſh verſification are reducible to eight kinds, four of two and four of three ſyllables; as,

Diſſyllabic Feet.

1. An iambus, ⏑ –; as, bĕtrāy, conſíſt.
2. A trochee, – ⏑; as, ēxtŏrt, gū'ĭltleſs.
3. A ſpondee, – –; as, the pāle mōōn.
4. A pyrric, ⏑ ⏑; as, ŏn thĕ tall tree.

Triſyllabic Feet.

5. An anapæſt, ⏑ ⏑ –; as, cŏntrăvēne, acquiéſce.
6. A dactyl, – ⏑ ⏑; as, lābŏurĕr, póſſible.
7. An amphibrac, ⏑ – ⏑; as, dĕlīghtfŭl, doméſtic.
8. A tribrach, ⏑ ⏑ ⏑; as, numĕrăblĕ, cónquerable.

Thoſe feet of which verſe may be wholly or chiefly formed are termed *principal* feet. Such are the trochee, iambus, dactyl, and anapæſt. The others are denominated *ſecondary* feet, becauſe their uſe in Engliſh verſification, is merely to diverſify the rhythm and to improve the verſe.

I. *Iambic Verſe.*

1. *Iambic Monometer Catalectic.*—This verſe, which is the ſhorteſt form of the Engliſh iambic, conſiſts of an iambus and an additional ſhort ſyllable. It is only found in ſtanzas: we have no poem, (or *monocolon,*) formed excluſively of this meaſure.

> Ăſsāilĭng,
> Ăvāilĭng,
> Rĕlēntĭng,
> Rĕpēntĭng.

2. *Iambic Monometer Acatalectic.*—This verſe, which is alſo too ſhort to be continued through any great number of lines, contains an iambic metre, or two iambic feet; as,

> With răptūr'd eārs
> Thĕ mŏnărch heārs.—Dryden.

3. *Iambic Monometer Hypercatalectic.*—This verſe is the ſame as the former, with an additional ſhort ſyllable, as,

> Ŭpŏn ă mōuntăin
> Beſide a fountăin.

4. An

4. *An Iambic Dimeter Brachycatalectic.*—This form consists of three iambic feet; being one foot less than the iambic dimeter; as,

Thoŭgh ĭn thĕ ūtmŏst pēak
A while we do remain,
Amongst the mountains bleak,
Expos'd to sleet and rain,
Nor sport our hours shall break,
To exercise our vein.—Drayton.

5. *An Iambic Dimeter Catalectic.*—This verse is only one syllable less than the iambic dimeter; as,

Oŭr hēarts nŏ lōngĕr lānguĭsh.

6. *An Iambic Dimeter Acatalectic.*—This form contains exactly, without redundance or defect, two iambic metres, or four feet; as,

Thĕ spācioŭs fīrmămēnt ŏn hīgh
With all the blue ethereal sky
And spangled heav'ns, a shining frame,
Their great original proclaim.—Addison.

7. *An Iambic Trimeter Brachycatalectic.*—This species of verse contains one foot, (or two syllables,) less than the iambic trimeter; as,

Dĕfēr nŏt tīll tŏ mōrrŏw tŏ bĕ wīse;
To-morrow's sun to thee may never rise.

The cobwebb'd cottage with its ragged wall
Of mouldr'ing mud is royalty to me!
The spider's most attenuated thread
Is cord, is cable to man's tender tie
On earthly bliss; it breaks at every breeze.—Young.

This is also termed the heroic measure. In its pure or unmixed state it consists of five iambic feet only. But here we may remark, once for all, that not only this, but most of the English common measures admit, for the sake of variety, of the occasional introduction of other feet, as the trochee, dactyl, anapæst, &c.

8. *An Iambic Trimeter Acatalectic.*—This verse is commonly called the Alexandrine. It consists of six iambic feet; as,

Ĕspēciăl aūdiĕnce crāves, ŏffēndĕd wīth thĕ thrōng.
Drayton.

The Alexandrine verse is now used only to diversify heroic lines; as,

Thĕ sēas shăll wāste, thĕ skīes ĭn smōke dĕcāy.
Rocks fall to dust, and mountains melt away;
But fix'd his word, his saving pow'r remains;
Thy̆ rēalm fŏr ēvĕr lāsts, thy̆ ōwn Mĕssīăh rēigns.

9. *An Iambic Tetrameter Brachycatalectic.*—This last iambic form consists of one foot less than four iambic metres, *i. e.* of seven iambuses; as,

Ănd ās thĕ mīnd ŏf sūch ă mān, thăt hāth ă lōng wāy gōne,
Ănd eīthĕr knōwĕth nōt hĭs wāy, ŏr ēlse wŏuld lĕt ălōne.
Chapman.

But it is more usual now to break this verse into a lyric measure, or into two verses, consisting alternately of eight and six syllables; as,

Whĕn ĭn thĕ slīpp'ry̆ pāths ŏf yōuth,
With hēedlĕss stēps, Ĭ rān,
Thine arm unseen, convey'd me safe,
And led me up to man.—Addison.

II. *Trochaic Verse.*

1. *A Trochaic Monometer Catalectic.*—This, which is the shortest trochaic verse in the English language, consists of one trochee and a long syllable; as,

Ōthĕr jōys
Āre bŭt tōys.—Walton.

2. *A Trochaic Monometer Acatalectic.*—This verse consists of one trochaic metre, or two trochaic feet; but both this and the last verse are too brief to form a monocolon; as,

Īn thĕ grāssy̆
Meādŏw vērdănt.

3. *A Trochaic Monometer Hypercatalectic.*—This form of trochaic verse contains one syllable more than the exact trochaic monometer; as,

Hāppy̆ fārmĭng āge,
Heālthy̆, blīthe ănd sāge.

4. *A Trochaic Dimeter Brachycatalectic.*—This species of trochaic verse contains two syllables, or one foot less than two trochaic metres; *i. e.* three trochees; as,

Blōŏm yĕ sūmmĕr rōsĕs.

5. *A Trochaic Dimeter Catalectic* consists of one syllable less than two trochaic metres; or of three trochees with an additional long syllable; as,

Fāirĕst pīece ŏf wēll-fōrm'd eārth
Urge not thus your haughty birth.—Waller.

6. *A Trochaic Dimeter Acatalectic* contains two trochaic metres or four trochaic feet; as,

Roūnd ŭs shīne thĕ sūn-beāms brīghtĕr.

7. *A Trochaic Dimeter Hypercatalectic* contains a long syllable more than the last verse; as,

Seē yŏn cloūds thăt nōw dĭspērse ănd clēar.

8. *A Trochaic Trimeter Brachycatalectic* is, as well as the last, seldom employed; it contains five trochaic feet, and, of course, one foot less than three trochaic metres; as,

Āll thăt wālk ŏn fōŏt, ŏr rīde ĭn chārĭots,
All that dwell in palaces or garrets.

9. *A Trochaic Trimeter Acatalectic* contains six trochees, or three trochaic metres; as,

Ōn ă mōuntăin strētch'd bĕnēath ă hōary̆ wīllŏw
Lay a shepherd swain, and view'd the rolling billow.

III. *Anapæstic Verse.*

The reader will recollect that we have already said, that in dactylic and anapæstic measure one foot forms a metre, but in every other case, two feet form a metre.

1. *The Anapæstic Monometer Acatalectic* contains, without redundance or defect, one anapæstic foot; as,

Nŏw ăgāin
They remain.

But as by laying the stress of the voice on the first syllable, we reduce the verse into trochaic rhythm, this measure is ambiguous; hence the simplest form of our regular anapæstic verse is the

2. *Anapæstic Dimeter Acatalectic*, or verse of two anapæstic feet; as,

Fŏr nŏ ārt cŏuld ăvāil.

3. *The Anapæstic Dimeter Hypercatalectic* contains two anapæstic feet, with an additional short syllable; as,

> Ĭn thĕ cāve | ŏf thĕ moūn-¦-tain.

4. *The Anapæstic Trimeter Acatalectic* contains three anapæstic feet; as,

> Ŏ yĕ wōōds, sprĕad yōur brānchĕs ăpāce;
> To your deepest recesses I fly;
> I would hide with the beasts of the chase
> I would vanish from every eye.

5. *The Anapæstic Tetrameter Acatalectic* consists of four anapæstic feet; as,

> Māy Ĭ gōvĕrn mȳ pāssions with ābsōlūte swāy;
> And grow wiser and better as life wears away.—Pope.

6. *The Anapæstic Tetrameter Hypercatalectic* adds to the end of the last verse a short syllable; as,

> Ŏn thĕ tōp | ŏf thăt hill | sēe thĕ sūn | nŏw ăscĕnd-¦-ing.

Of the Cæsura.

The same advantages result from a suitable and appropriate use of the cæsura in English verse, as in that of the French and Italian, which we have just noticed. What is peculiar to this pause amongst us may be briefly comprised under the following particulars.

1. In heroic verse the cæsura may take place on the fourth syllable; as,

> Child of the sun″, refulgent summer comes.

2. Or on the fifth syllable; as,

> He comes attended″ by the sultry hours.

3. Or on the sixth syllable; as,

> But should he hide his face″, th' astonish'd sun.

4. Or, two cæsuras may divide a verse into three portions; as,

> Some love to stray″; there lodg'd″, amus'd and fed.

5. Some lines admirably admit that subdivision of the cæsural pause, which may be called a *demi cæsura*; as,

> Glows′ while he reads″, but trembles′ as he writes.
> Rides′ in the whirlwind″ and directs′ the storm.

> Warms′ in the sun″ refreshes′ in the breeze,
> Glows′ in the stars″ and blossoms′ in the trees;
> Lives′ through all life″ extends′ through all extent,
> Spreads′ undivided′, operates′ unspent.

As we have now treated minutely on every point essential to Hebrew, Greek, Latin, French and Italian versification, our readers will permit us, in accommodation to the limits of our work, to refer them, for further information on English versification, to what has been said at the article Ode, Epigram, Sonnet, &c. in other parts of this work.

VERSIO Chemica, a term used by chemical writers to express a change, wrought by their art, of manifest forms into occult ones, which, they say, is done by a corruption of the specific form, and the generation of a more general one; that is, by a conversion of decompounded elements into compound bodies, and of impure into such as are perfectly pure.

VERSION, a translation of some book, or writing, out of one language into another.

The chief objects which ought to be regarded by every translator, and more especially by a translator of sacred scripture, are the following: *viz.* to give a just and clear representation of the sense of his original; to convey into his version as much of his author's spirit and manner as the genius of the language, in which he writes, will admit; and, as far as may be consistent with these two ends, to express himself with purity in the language of the version.

The ancient versions of the New Testament, in particular, have been justly considered as affording an important evidence of its antiquity, and presumptively of its authenticity. Some of these are supposed to have been made so early as the first century; such as the Syriac, and several Latin versions, the latter of which, abounding in Hebraisms and Syriasms even in a greater degree than the original, were manifestly made by native Jews, and must have been productions of the first century. A book, therefore, so early and universally read throughout the East in the Syriac, and throughout Europe and Africa in the Latin translation, must be able to lay claim to a high antiquity. To the strange and trivial hypothesis, that the New Testament was forged in the fifth century, after the conquest of Italy by the Goths, the Gothic version of Ulphilas, which was made in the preceding century, will serve for a sufficient answer. For an account of the *Anglo-Saxon*, *Arabic*, *Armenian*, *Coptic* or *Egyptian*, *Ethiopic*, and *Gothic* versions, see Bible. See also Armenian and Cophtic.

Version *of Aquila*. See Aquila and Hexapla.

Versions, *Greek*. See Septuagint, and *Greek* Bibles.

Version, *Italic*, called by St. Jerom the *common* and *vulgar*, and by Gregory the Great the *ancient*, was made in Italy, and for the service of the Latin Christians. As it was used in the church till the sixth century, there are several fragments of it extant in the quotations of those Latin fathers, who wrote before that time. As this version continued, partly from the influence of custom, partly from respect to antiquity, to be regarded and used by many, there is reason to believe that a part of that version still remains in the Vulgate, and is in a manner blended with it. (See Vulgate.) From what remains of the old Italic, it appears to have resembled almost all the Jewish translations, and to have been very literal, and consequently, in a great degree, obscure, ambiguous, and barbarous. Dr. Mills supposes, that this version was the work of several persons in the second century, by order of pope Pius I., who was an Italian. This learned writer, in his "Prolegomena," has given an account of the qualities of this version; and how far it may be of use for discovering the true reading of the original Greek. St. Jerom, in his translation, has deviated from this version without sufficient reason.

Version, *Latin*, includes not only the *Italic*, (see the preceding article,) but other versions made before and since the time of Jerom, as well as that which he corrected and published. (See Vulgate.) It appears from the testimony of Augustin (De Doctrinâ Christianâ, lib. ii. c. 11.), that the Latin church had a great number of translations of the bible, that they were made at the first introduction of Christianity, but that the authors are totally unknown. Some of these Latin versions were probably written later than the first ages of Christianity. The style of these ancient versions, still perceivable in the Vulgate, though amended by Jerom, is not only devoid of classical elegance, but inaccurate and impure. False Latin frequently occurs, and such as no native Roman could have written. Errors of this kind, and a too servile attention to the idiom of the Greek, betray a translator, who was neither a native Italian, nor had learned the language by the rules of grammar.

At

At other times, we find expressions that seem to be improper, and that nevertheless are justifiable according to the usage of the Italian language. Words are also used in a sense that is very rare in the classic writers. Moreover, these versions contain very numerous Hebraisms, or rather Syriasms, that are diametrically opposite to the genius of the Latin: from which circumstance we may infer, that some of these versions were made by Jewish converts, whose native language was the Syriac. The language of these versions has materially influenced the Latin of the church, which is not only unclassical, but has a tincture of the oriental idiom, though in a much lower degree than the versions themselves.

Michaelis differs from Mills, who refers the origin of the oldest Latin version no higher than to the time of pope Pius, in the middle of the second century, and who supposes that the Latin version was made by public authority, or under the direction of the bishop of Rome. It is, says the professor, very improbable, if a translator had been appointed by a bishop or a council, that a writer would have been chosen, who was so little master of the Latin. He therefore supposes, that the real state of the case was as follows. The New Testament was read in the Christian churches, in the same manner as the Old Testament in the Jewish synagogues; and as the Jews, after reading the original Hebrew, explained it by a Chaldee paraphrase, the Christian bishops and public teachers expounded the passages in Latin, which they first read in the Greek. At first this was done extempore; but by degrees, in order to facilitate the public service, these translations were committed to writing, and at length communicated to the different members. By these means we may account for their great variety, and the confusion, which might have been avoided by a version ordained by the public authority of the Christian church.

As it cannot be denied, that the oldest Latin versions are of very high antiquity, though some of their readings are false, their principal use in the criticism of the New Testament is, that they lead us to a discovery of the readings of the very ancient Greek MSS. that existed prior to the date of any that are now extant. The great confusion which prevailed in the copies of the old Latin version induced pope Damasus to employ Jerom in correcting it; and among all the Latin fathers, before and after his time, it seems that no one was better qualified for the task. Jerom finished this work about the year 384; but F. Simon observes, that the Vulgate, after the time of Jerom, was manifestly different from the old version, in all the books of the New Testament. He partly expunged the spurious readings, and partly corrected the translations, which appeared to be erroneous; but it must be acknowledged, that, with the best intention, he has sometimes altered for the worse. See VULGATE, and *Latin* BIBLES.

The learned and ingenious Eichorn, in his Introduction to the Old Testament, supposes, not improbably, that the first Latin version of the bible was made in Africa, where Latin alone being understood, a translation was more necessary, where the Latin version was held in the highest veneration, and where the language being spoken with less purity, barbarisms might have more easily been introduced, than in a provincial town in Italy. But the Greek Testament could not have been translated into Latin before the canon had been formed, which was certainly not made in the first century. Michaelis by Marsh.

Of the modern Latin versions, the first we shall mention is that of Erasmus, who translated the New Testament from the Greek; following not only the printed copies, but also four Greek MSS., and varying very little from the Vulgate. The first edition appeared in 1516, and dedicated to pope Leo X.

Arius Montanus undertook, by order of the council of Trent, as some pretend, a version of the Old and New Testaments; following, in his translation of the Old Testament, Pagninus, keeper of the Vatican library, who had translated the Old Testament from the Hebrew, by order of Clement VIII. As for the New Testament, he only changed some words in it, where he found that the Vulgate differed from the Hebrew. See BIBLE.

A Latin version of the whole New Testament, except the Revelations, is ascribed to Thomas de Vio, a Dominican, commonly styled cardinal Cajetan; but not understanding Greek, he probably procured some person to perform the work in his name. This was printed at Venice in 1530 and 1531, with the cardinal's commentaries. Another Latin version was published by an English writer in 1540, and dedicated to Henry VIII.

The Zurich version is one of the most ancient Latin translations made by Protestants. Part of it was done by Leo Juda, one of the ministers of that city, aided by some of his learned brethren; but being prevented by death from completing it, he left it to the care of T. Bibliander, professor at Zurich, who, aided by Conradus Pellican, professor of Hebrew in the same place, translated the rest of the Old Testament. The New Testament was continued by Peter Cholin, professor in divinity, and by Rodolph Gualterus, Leo Juda's successor in the ministerial office. This version was published in 1544. The seventh verse of the fifth chapter of the first epistle of St. John is omitted in this version, and placed in the margin. This passage was not inserted by Erasmus in his first editions of the New Testament, because he did not find it in the Greek copies; but having afterwards found it in a MS. in England, he introduced it into subsequent editions. In the following years, Robert Stephens printed this edition, with a few alterations; joining to it the Hebrew text and the Vulgate, and notes from the public lectures of Vatablus. See *Latin* BIBLES.

Sebastian Castalio published a Latin bible, which has been both censured and admired. See *Latin* BIBLES, and CASTALIO.

Theodorus Beza's Latin version has been much approved by Protestants, but depreciated by the Roman Catholics. It has been also censured by bishop Walton and Dr. Mills. See BIBLE.

VERSION *of Origen*. See HEXAPLA and TETRAPLA.

VERSION, *Persian*. See BIBLE.

VERSION, *Peshito* and *Philoxenian*. See SYRIAC *Version*.

VERSION, *Slavonian* or *Russian*. See BIBLE.

VERSION, *Sahidic*. See BIBLE.

VERSION, *Syriac*. See SYRIAC *Version*, and BIBLE.

For an account of *English*, *Flemish*, *French*, *Gaelic*, *Georgian*, *German*, *Indian*, *Irish*, *Italian*, *Rhenish*, *Saxon*, *Spanish*, and *Welsh* versions, see BIBLE. See also POLYGLOTT.

VERSITZ, or VERSECZ, in *Geography*, a town of Hungary. It is the see of a Greek bishop, and contains some extensive barracks, with about 12,000 inhabitants. Near it are the ruins of a castle; 20 miles N.N.W. of Vipalanka.

VERSMOLD, a town of the county of Ravensburg; 10 miles N.W. of Bielefeld. N. lat. 52° 2'. E. long. 8° 5'.

VERSO. See FOLIO *Verso*.

VERSOIX, in *Geography*, a town of France, in the department of the Ain, at the mouth of a river of the same name, on the side of the lake of Geneva; 6 miles S.E. of Gex.

Versoix, *La*, or *Versoy*, a river which rises in France, and runs into the lake of Geneva at Versoy.

VERSOU, Le, a town of France, in the department of the Isere; 6 miles N. of Grenoble.

VERSOY, a town of France, in the department of Mont Blanc; 4 miles N. of St. Maurice.

VERST, or Werst, a Russian measure, containing 500 sashes or 1500 arsheens = 3500 English feet. Hence 264 versts = 175 English miles; so that a verst is nearly two-thirds of an English mile, and a degree of the meridian is reckoned to be about 104 versts. The Russian foot is = $13\frac{3}{4}$ English inches, and the Moscow foot = $13\frac{1}{4}$ English inches; but the English foot is generally used at Petersburg, and also the Rhineland foot = $12\frac{1}{10}$ English inches. See Measure.

VERSTEGAN, Richard, in *Biography*, a descendant of an ancient family in Guelderland, and the son of a cooper in London, enjoyed the advantage of a liberal education at Oxford, and distinguished himself by his literary acquirements; but becoming a Catholic, he left the university without a degree, and removed to Antwerp. About the year 1585, he there published a work, entitled "Theatrum Crudelitatum Hæreticorum nostri Temporis," adorned with engravings, and intended as a counterpart to the Protestant Martyrologies. In this work he treated queen Elizabeth with great severity; and when Verstegan removed to Paris, complaint was preferred against him by the English ambassador to Henry III., who, from motives of policy more than from a disapprobation of his book, caused him for some time to be imprisoned. After his release, he returned to Antwerp, where he employed himself as a printer, and published, in 1592, a second edition of his Theatrum. He also entered with much acrimony into a dispute between the regular and secular Roman Catholic clergy in England, taking part with the former. But he was more honourably and usefully employed in preparing his "Restitution of decayed Intelligence in Antiquities concerning the noble and renowned English Nation," which was first printed at Antwerp in 1605, 4to. Bishop Nicolson's character of this work is as follows: "The writer had several advantages for making of some special discoveries on the subject whereon he treats, which is handled so plausibly, and so well illustrated with handsome cuts, that the book has taken, and sold very well. But a great many mistakes have escaped him." Some of these are stated by the bishop; and he adds, they have been carefully corrected by Mr. Somner. The last of three editions of this work that issued from the press in England was that of 1674. Among some other works of Verstegan, we find mentioned his "Antiquitates Belgicæ," Antwerp, 1613. He is supposed to have died about the year 1625. Biog. Brit.

VERT, Dom Claude de, was born at Paris in 1645, and at the age of 16 entered into the order of St. Benedict, in the Congregation of Cluni. In the Jesuits' college at Avignon he studied philosophy and theology; and after his return from a journey to Rome, he devoted himself to the study of the rule of St. Benedict, and contributed by his influence to the establishment of general chapters. In 1676 he and another monk were appointed to the office of reforming the breviary of the order. The result of their labour appeared in 1686; and in 1689 he published a translation of the rule of St. Benedict, with a preface and learned notes. In 1690 he wrote a letter to Jurieu, who had expressed himself contemptuously of the ceremonies of the church; and in 1690 he was rewarded for his services, by the dignity of vicar-general to the cardinal de Bouillon, and the priory of St. Peter in Abbeville. His work most known is entitled "Explication simple litterale et historique des Ceremonies de l'Eglise," 4 vols. 8vo. The writer died at Abbeville in 1708, aged 63, leaving the character of a pious, as well as a mild and polished man. Moreri.

Vert, in *Heraldry*, the term for a green colour.

It is also called vert in the blazon of the coats of all under the degrees of nobles; but in coats of nobles it is called *emerald*; and in those of kings, *Venus*.

In engraving, it is expressed by diagonals, or lines drawn athwart, from right to left, from the dexter chief corner to the sinister base.

In lieu of vert, the French heralds use *sinople*, or *synople*.

Vert, or *Green Hue*, in *Forest Law*, any thing that grows and bears a green leaf, within the forest, that may cover a deer.

This is divided into *over-vert* and *nether-vert*. The former is the great woods, which, in law-books, are usually called *hault-bois*; and the latter is the under-woods, otherwise called *sub-bois*.

We sometimes also meet with *special* vert, which denotes all trees growing in the king's woods within the forest, and those which grow in other men's woods, if they be such trees as bear fruit to feed the deer.

Vert, in *Geography*, a river of France, which runs into the Gave of Oleron.—Also, a river of France, which runs into the Lot, near Cahors.

Vert *St. Denis*, a town of France, in the department of the Seine and Marne; 3 miles N.W. of Melun.

VERTACOMECORI, in *Ancient Geography*, a people to whom Pliny ascribes the foundation of Navarre, in Gallia Cisalpina, and who formed a part of the Vocontii.

VERTÆ, a people of Asia, allies of the Persians, and found at the siege of Amida.

VERTAISON, in *Geography*, a town of France, in the department of the Puy de Dôme; 4 miles N.W. of Billon.

VERTE Bay, or *Green Bay*, a bay of the Atlantic ocean, between Nova Scotia and New Brunswick, on the north coast. N. lat. 46°. W. long. 63° 54′.

Verte *Bay*, a bay on the north-east coast of Newfoundland. N. lat. 50° 10′. W. long. 56°.

VERTEBRÆ, in *Anatomy*, the bones composing the spine. They are distinguished by their situation into vertebræ colli, dorsi, and lumborum; or cervical, dorsal, and lumbar. See Spine.

The cartilages between the vertebræ of the back yield considerably to the pressure of the body, in an erect posture, and expand themselves in the night, when persons lie down. Hence arises a very singular phenomenon, but a very true one; which is, that a man is considerably taller at his rising in the morning, after the expansion of these cartilages, during the absence of the pressure for several hours, than at night, when they have been pressed down all the day.

The reverend Mr. Wasse seems to have examined this difference more strictly than any other person. He found that several persons, enlisted as soldiers in a morning, had been discharged for want of height, on their being measured again before the officers in the evening; and on this occasion measured several other people, and found the difference, in many cases, to be not less than an inch. This gentleman observed in himself, that fixing a bar of iron where he just reached it with his head on getting first out of bed in the morning, he could lose near half an inch in an hour, or less, if he employed that time in rolling his garden, or any other exercise of that laborious kind. He observed also, that riding often took off the height very suddenly; and what was more particular, that in sitting close to study five or six

fix hours without any motion, he loft often a whole inch in height.

People who ufe hard labour fink rather lefs in the whole than thofe of fedentary lives; and the height once loft is never to be recovered that day, not even by the ufe of the cold bath; but a night's lying down can alone reftore it. Phil. Tranf. N° 383. p. 87.

This difference in height takes place only in the human fpecies, as they are the only creatures who walk erect, and throw the preffure of their whole weight upon the backbone. This gentleman meafured horfes before and after riding, and could find no difference even after the longeft journeys.

The alteration in height is much greater in young people than in thofe who are more aged. It is evident from this change happening to perfons when they fit, as well as when they ftand, that it is brought about merely by the backbone; and we muft admire the ftructure of that part of the body, which owes its giving way thus to its being formed together in that manner, which alone could fuit it to the feveral purpofes it was intended for. The thicknefs and fhortnefs of the bones, with the intervening cartilages, affifted by the bony proceffes, difpofe it to a motion peculiar to itfelf; whereas, had the bodies been of any confiderable length, upon bending the body, the articulations muft have made a large angle upon their inmoft edges, and the fpinal marrow would have been continually liable to be injured; and had the cartilages been entirely wanting, it would have been as ufelefs as if it were but one bone, by which the trunk of the body, being rendered incapable of bending, muft have remained for ever in an erect pofture. Another particular, which befpeaks the utmoft wifdom and defign in the contrivance of this part is, the remarkable difference there is in the cartilages placed between the feveral bones of the fpine.

The vertebræ of the back require but little motion, and the cartilages there are for that reafon fmall and thin, in comparifon with thofe of the loins, which being very thick, the loweft more efpecially, the motion is much greater there, and much better to be borne. This being the ftate and difpofition of the parts during the whole fpace of time in which we are ufually employed about our feveral bufineffes, till the time that we difpofe ourfelves to reft, the cartilages of the fpine will, by their compreffible and yielding properties, become more clofe and compact for the preffure they fuftain, and confequently the fpine, which is the only fupport of the trunk of the body, will become fhorter; but when this fuperior weight fhall be entirely removed, by placing the body in an horizontal pofture, as it always is when we are in bed, the compreffed cartilages will, by their natural elaftic power, begin gradually to enlarge themfelves, till they, by degrees, recover the expanded ftate they had before they gave way.

The cartilages between the feveral vertebræ are twenty-four in number, and every one of thefe is preffed fomewhat in our daily employments, fo that when they all come to expand, the aggregate of their feveral expanfions cannot be fuppofed lefs than about an inch. Now, if this be the difference occafioned by the preffure of the common weight of the body alone upon itfelf, it muft neceffarily be much greater in thofe perfons whofe conftant employment is to carry heavy burdens. The compreffion and expanfion of the cartilages in older people being lefs than in younger, is a neceffary confequence of the cartilages in time of age growing harder, and lefs capable of compreffion; for they often grow almoft bony in length of time: and hence it is, that old people are obferved to lofe fomewhat of their former height, the cartilages in them fhrinking to a fomewhat fmaller compafs as they grow bony; and this fhortening is, therefore, not imaginary, as many have believed, but real, and owing to this plain caufe. Phil. Tranf. N. 383. p. 90. See Cartilage and Spine.

Vertebræ, *Difeafe of the.* See Spine.

Vertebræ, *Diflocations of.* See Luxation.

Vertebræ, *Fractures of.* See Fracture.

Vertebræ *of Fifh.* The vertebræ of fifh are extremely different in fhape in the feveral kinds, and even vary in number in the different fpecies of the fame genus. The anterior vertebræ in fome have three apophyfes, as in the cyprini, efoces, pleuronecti, &c.; and in the clupeæ they have no lefs than feven of thefe apophyfes, but they are flender and capillary. Artedi Ichthyol.

VERTEBRAL *Artery* and *Vein*, in *Anatomy*, branches of the fubclavian veffels. See Artery and Vein.

Vertebral *Canal*, the canal of the fpine, which contains the medulla fpinalis. See Spine.

Vertebral *Nerves*, the nerves fent off from the medulla fpinalis, and paffing out at the lateral holes of the fpine. See Nerve.

Vertebral *Theca*, the fheath of dura mater inclofing the medulla fpinalis. See Brain.

VERTEILLAC, in *Geography*, a town of France, in the department of the Dordogne; 7 miles N. of Riberac.

VERTENEGGI, a town of Iftria; 11 miles S. of Capo d'Iftria.

VERTERIS, in *Ancient Geography*, a town of Great Britain, in the fecond route of Antonine, between Brovonacæ or Kirbythure and Lavatræ or Bowes, and in the fifth route between Lavatræ and Brocavum or Brougham Caftle, placed at Brugh under Stanemore.

VERTEUIL, in *Geography*, a town of France, in the department of the Charente; 3 miles S. of Ruffec.—Alfo, a town of France, in the department of the Lot and Garonne; 6 miles N.N.E. of Tonneins.

VERTEX, in *Anatomy*, the crown of the head, or that uppermoft and middle part fituated between the finciput and occiput. See Head.

Hence, alfo, vertex is figuratively ufed for the top of other things. Thus, the vertex of a cone, pyramid, conic fection, &c. is the point of the upper extremity of the axis, or the top of the figure.

Vertex *of an Angle*, is the angular point, or the point A, (*Plate* II. *Geometry*, *fig.* 15.) in which the legs meet.

Vertex *of a Figure*, is the vertex of the angle oppofite to the bafe.

Such is the point M (*Plate* XV. *Geometry*, *fig.* 17.) oppofite to the bafe A B.

Vertex *of a Curve*, is the point A (*Plate* XV. *Geometry*, *fig.* 18.) from which the diameter is drawn; or it is the interfection of the diameter and the curve.

Vertex *of a Glafs*, in *Optics*, the fame with the pole of it.

Vertex is alfo ufed, in *Aftronomy*, for the point of heaven perpendicularly over our heads, called the *zenith*.

Vertex, *Path of the.* See Path.

VERTIBULUM, a word ufed by fome writers to exprefs the round head of a bone, which, in its articulation, is inferted into the finus, or cavity of another bone.

VERTICAL, in *Botany*, is technically ufed to exprefs the perpendicular pofition, or infertion, of certain parts of a plant. Vertical Leaves are fuch as ftand fo erect, that neither of their furfaces can properly be called the upper or under, of which nature are all fword-fhaped leaves, *folia enfiformia.* (See Leaf.) But the term is ufually reftricted to

to such leaves as have properly an under surface, different in nature from the upper one, and yet stand upright; witness *Lactuca Scariola*, and perhaps several succulent leaved plants.

Vertical Anthers, as in the Tulip, terminate the filaments, and being inserted by one of the extremities, stand no less upright than the filaments themselves, being opposed to incumbent anthers, whose insertion is generally lateral, and whose position is more or less horizontal, over the stigma, as in the Passion-flower. In both these instances the anthers are remarkably versatile, *antheræ versatilis;* allowing themselves to be turned round many times without separating from the filament. Vertical stalks, &c. readily explain themselves.

VERTICAL *Circle*, in *Astronomy*, is a great circle of the sphere, passing through the zenith and the nadir, and any other given point on the surface of the sphere.

The vertical circles are also called *azimuths;* which see. The meridian of any place is a vertical circle. All the vertical circles intersect each other in the zenith and nadir.

The use of the vertical circles is to measure the height of the stars, and their distances from the zenith, which is reckoned on these circles; and to find their eastern and western amplitude, by observing how many degrees the vertical, in which the star rises or sets, is distant from the meridian.

VERTICAL, *Prime*, is that vertical circle, or azimuth, which passes through the poles of the meridian; or which is perpendicular to the meridian, and passes through the equinoctial points.

VERTICALS, *Prime*, in *Dialling*. See PRIME *Verticals*.

VERTICAL *of the Sun*, is the vertical which passes through the centre of the sun at any moment of time.

Its use is, in dialling, to find the declination of the plane on which the dial is to be drawn, which is done by observing how many degrees that vertical is distant from the meridian, after marking the point, or line of the shadow, upon the plane at any time.

VERTICAL *Dial*. See *Vertical* DIAL.

VERTICAL *Line*, in *Conics*, is a right line drawn on the vertical plane, and passing through the vertex of the cone.

VERTICAL *Line*, in *Dialling*, is a line in any place perpendicular to the horizon.

This is best found and drawn on an erect and reclining plane, by holding up a string and heavy plummet steadily, and then marking two points of the shadow of a thread on the plane, a good distance from one another; and drawing a line through those marks.

VERTICAL *Line*, in *Perspective*. See *Vertical* LINE.

VERTICAL *Plane*, in *Conics*, is a plane passing through the vertex of a cone, and parallel to any conic section.

VERTICAL *Plane*, in *Perspective*. See PLANE and PERSPECTIVE.

VERTICAL *Point*, in *Astronomy*, the same with vertex or zenith.

Hence a star is said to be vertical, when it happens to be in that point which is perpendicularly over any place.

VERTICILLARIA, in *Botany*, Fl. Peruv. 69, a Peruvian genus of plants, so called because its branches are disposed in regular whorls, one above the other. *De Theis*. See VERTICILLUS.

VERTICILLATÆ, Whorled-flowered plants, form the 42d natural order in Linnæus's natural system, being precisely analogous to Jussieu's LABIATÆ (see that article); as well as to the order of *Didynamia Gymnospermia* in the Linnæan artificial system, except that it includes also several diandrous genera of the latter arrangement. Ray first established this order, under the above name, and distinguished it, though not by a very clear or infallible definition, from his own *Asperifoliæ*. Hermann injudiciously combined these two orders. Linnæus first clearly defined their differences. Both have four naked *seeds*, and a monopetalous *corolla;* which is regular in all the *Asperifoliæ*, except ECHIUM; irregular in all the *Verticillatæ*, and also ringent, or at least two-lipped, except MENTHA and LYCOPUS; see those articles. The *Asperifoliæ* have, moreover, alternate or scattered leaves; the *Verticillatæ* opposite ones; the former are more of a mucilaginous quality; the latter more aromatic. Linnæus however detected the true characters of the orders in question in their *stamens*. These in the *Asperifoliæ* are five, all of equal length; in the *Verticillatæ* either four or two; if four, two are longer, or more perfect, than the rest.

For the genera which compose this order of *Verticillatæ*, and their general characters and properties, the reader is referred to the article LABIATÆ. Their particular mode of inflorescence is explained under VERTICILLUS; though in many instances their whorls are so crowded together as to form a spike, or cluster, the foliage diminishing, or changing, into *bracteas*. Of this, examples occur in *Salvia*, *Mentha*, and *Origanum*, with some other genera.

This being one of the most natural of all the orders in the whole vegetable kingdom, few botanists have succeeded in defining its genera. Linnæus has been eminently successful in this point, having happily seized some essential character by which each genus is clearly marked, in one part or other of the fructification; such characters being, on the whole, as well supported by the habit as can be expected in so natural an order.

VERTICILLUS, a Whorl, is a mode of inflorescence, in which the flowers surround the stem in a sort of ring. There is seldom a perfectly whorled insertion of the flowers, around a stem or stalk, independent of the leaves, though the rare genus GNETUM, (see that article,) may afford an instance. It is most usual for each flower to be axillary, or accompanied by a leaf, as in *Hippuris*. Nevertheless the natural order of VERTICILLATÆ, so denominated from this circumstance, is considered as having truly whorled flowers, though inserted on two opposite sides of the square stem; as they, being commonly very numerous and crowded, spread into one dense uninterrupted mass. Such may, or may not, be accompanied by leaves or bracteas.

Folia verticillata, whorled leaves, are when more than two leaves surround the stem at one point, or articulation. Examples occur in *Galium* and its allies, thence called by Ray and following authors *plantæ stellatæ;* as well as in a few of the first species of VERONICA. Peruvian shrubs are remarkably inclined to bear three or four leaves in a whorl, though the genera, or natural orders, to which they respectively belong, have merely opposite leaves. See under the article LEAF, *folia, bina, terna*, &c.

Whorled *Cotyledons* are very rare, but they do occur in PINUS and DOMBEYA.—Even if such were, as Jussieu suggests, merely opposite cotyledons in numerous deep segments, they might perhaps, according to the analogy of the above-described inflorescence, be called *cotyledones verticillatæ*.

VERTICITY, is that property of the load-stone by which it turns or directs itself to some particular point.

The attraction of the magnet was known long before its verticity.

VERTICORDIA, in *Mythology*, one of the epithets of Venus. See VENUS.

VERTIGO, in *Medicine*, from *verto, I turn, giddiness, dizziness*, or *swimming of the head*, a well-known affection, in which

which external objects appear to move in various directions, though stationary, and there is a difficulty of maintaining the erect posture, often accompanied with sickness.

Philosophers have differed in their opinions respecting the cause of *vertigo*, when it is produced under various circumstances, independently of internal disease; as from swinging, turning round rapidly, looking from a high station, riding across a broad undulating stream, or over a plain covered with snow, or looking at the walls of a room painted with equal small figures, at a whirling wheel, &c. &c.; circumstances which might appear upon a casual view not explicable upon one common principle. Dr. Darwin, however, has very ingeniously explained the origin of giddiness from these various causes. He observes, that in learning to walk, we judge of the distance of the objects which we approach by the eye, and by observing their perpendicularity determine our own; and that at all times we determine our want of perpendicularity, or inclination to fall, by attending to the apparent motion of the objects within the sphere of distinct vision. Hence, when we are placed upon the summit of a high cliff or tower, and look down, we become dizzy, because the objects below are out of the sphere of distinct vision, and we are obliged to balance ourselves by the less accurate feelings of our muscles. Hence also, on going into a room hung with a paper which is covered all over with similar small black lozenges, many people become giddy; for the objects around being so small, that they do not perceive their minute parts, or so similar, that they do not distinguish them from one another, they begin to lose their balance; for on inclining to one side or the other, the next and the next lozenge succeeds on the eye, which they mistake for the first, and they are not aware that they have any apparent motion; but if you fix a sheet of paper, or draw any other figure in the midst of the lozenges, the charm ceases, and no giddiness is produced. Giddiness is occasioned in a similar way in riding over an extensive plain of snow or sheet of water, in which no distinct object presents itself by which we can ascertain our perpendicularity.

But the circumstance which occasions vertigo in the other cases, is the difficulty of distinguishing our own real motions from the apparent motions of external objects; and the difficulty is still greater, when both ourselves and the circumjacent objects are in motion. Our daily practice of walking and riding soon instructs us with accuracy to discern the modes of motion, and to ascribe the apparent motion of the ambient objects to ourselves; but those which we have not acquired by repeated habit continue to confound us. Hence whirling round, swinging, skating on the ice, sailing, riding backwards in a coach, and a thousand other movements, produce giddiness, which, if long enough continued, bring on sickness and vomiting. When first an European mounts an elephant sixteen feet high, and whose mode of motion he is not accustomed to, the objects seem to undulate as he passes, and he frequently becomes sick and vertiginous. And when we first go on ship-board, where the movements of ourselves, and the movements of the large waves are both new to us, the vertigo is almost unavoidable, with the terrible sickness which attends it. Yet in persons habituated to these motions, no vertigo occurs; even the most continued whirling, as practised by the dervises in Turkey, as a religious ceremony, and by European waltzers, may be learnt to be performed without giddiness.

Dr. Darwin mentions several other circumstances, which prove that we require experience in the motions of surrounding objects, even while we are ourselves at rest, in order to determine our own perpendicularity by them. Whence some people become dizzy at the sight of a whirling wheel, or by gazing on the undulations of a river, if no steady objects are at the same time within the sphere of their distinct vision. And he mentions the following curious experiment, illustrating this fact. When a child first can stand erect upon his legs, if you gain his attention to a white handkerchief steadily extended like a sail, and afterwards make it undulate, he instantly loses his perpendicularity, and tumbles on the ground. See Zoonomia, vol. i. sect. 20.

Vertigo, however, arising from any of these causes, is not properly the subject of medical treatment; and it is only when it occurs independently of external circumstances, that it becomes the object of pathological inquiry. It is not in itself, indeed, considered as a distinct disease, but is always symptomatic of some other morbid affection, against which our remedies must be directed. Whence Dr. Cullen has excluded it altogether from his classification of diseases.

Vertigo occurs under three different states of the constitution, or is a symptom of three different species of disease, which it is necessary to distinguish, in order to apply the appropriate remedies. The first, and the only variety of vertigo that is accompanied with danger, is that which arises from an over-fulness of the vessels of the head, and which is sometimes the precursor of apoplexy or palsy. The vertigo from intoxication is probably chiefly produced in this way, though it may be partly explained upon the principle of debilitated muscular energy, by which the person is disabled from directing the eye steadily upon surrounding objects, and which even occasions double vision.

The vertigo originating from a plethoric state of the vessels of the brain will be indicated by the presence of certain other symptoms. If it occurs in a person of sanguine temperament, of a full habit of body, florid complexion, in the meridian of life, or past that period, and in one accustomed to free living; and if it is accompanied by occasional head-ache, throbbing of the vessels of the head, noise in the ears, and drowsiness; little doubt can remain that it originates from a plethoric condition of the vessels, and that the proper remedies will be, the abstraction of blood, either from the system at large, or by opening the temporal artery or jugular vein, or by the application of leeches to the temples; at the same time administering moderate purgative medicines, and enjoining an abstinence from fermented liquors, and high-seasoned food, as well as great moderation in respect to the quantity of the latter. If these remedies are not resorted to, and these precautions not adopted, the result may be a sudden attack of apoplexy, which may prove immediately fatal, or leave behind it a *hemiplegia*, or palsy of one side.

The second variety of vertigo, to which we have alluded, is attended with little hazard, though sometimes very distressing. It occurs in an opposite condition of the body, a state of nervous debility, and accompanies many of those anomalous affections which are comprehended under the appellations of *hysteria* and *hypochondriasis*. This vertigo occurs in persons of a different temperament from that above described; in thin and spare habits, or in those of a certain degree of corpulency, but pale and relaxed constitution. It is accompanied also by other symptoms characteristic of the hysterial and hypochondriacal diseases; and cannot easily be mistaken for the plethoric vertigo. The cure, of course, will depend upon the general features of the whole complaint, of which the vertigo is but a passing symptom, and we need not here enlarge upon the subject. See HYPOCHONDRIASIS and HYSTERIA.

There is a third variety of vertigo, which is also transient and void of danger; which is a symptom of indigestion; and is

is connected with particular conditions of the stomach. This is not permanent, but comes on suddenly for a few seconds or minutes, and then goes off; but during this short interval, the person, if walking, will seize a rail, or post, or fix himself against a wall, to preserve his perpendicularity; or even if sitting, will be obliged to hold the back of his chair firmly, or to lean forward on the table for the same purpose. This slight attack is generally attended with a feeling of beginning nausea, which subsides with the vertigo.

As this occurs in persons who are neither plethoric nor hypochondriacal, is unaccompanied by head-ache, and generally attended by flatulence, irregularity of bowels, or some other symptom of disturbance in the digestive organs, so it is easily distinguished from the preceding species. It is generally soon removed by the use of an absorbent, and gentle laxative, in some moderately cordial vehicle; as by a little carbonate and sulphate of magnesia in mint-water, or in an infusion of chamomile, or orange-peel; or by a portion of magnesia and rhubarb, or similar medicines.

Vertigo, in *Animals*. See Apoplexy and Staggers.

VERTILLAGE, in *Agriculture*, the tilling or preparing of ground to receive the seed, by turning, stirring, or tossing it.

VERTINÆ, in *Ancient Geography*, a small town of Italy, in the interior of Lucania, according to Strabo.

VERTOBRIGE, a town of Hispania, in Betica. Pliny.

VERTON, in *Geography*, a town of France, in the department of the Lower Loire; 4 miles N.E. of Nantes.

VERTOT D'AUBŒUF, René Aubert de, in *Biography*, a French historian, was born in 1655, at the seat of Bennetot in Normandy. Inclined to retirement, he entered, at the early age of 15 or 16, among the Capuchins, whose austerities so impaired his constitution, that he was under a necessity of obtaining a brief for exchanging this order for that of the regular canons of Prémontré, with which he connected himself in 1677. Some disputes, however, occurred in this order, which occasioned his abandoning it. After several changes of situation, humorously called the "Abbé de Vertot's revolutions," he settled at Paris in 1701, where he was employed in compiling the memoirs for the house of Noailles, engaged in a contest with that of Bouillon, for which service he obtained a pension. In 1705 he became a pensioner of the Academy of Inscriptions and Belles Lettres, which was revived in 1701; and afterwards occupied several posts in connection with the duke and duchess of Orleans. In 1715 he was appointed, by the grand-master of Malta, historiographer to that order, with its attendant privileges, and the right of wearing the cross; and the commandery of Santeny was added to his other preferments. Some have said that he was sub-preceptor to Lewis XV., but he was deprived of this honour. As he advanced in life, his infirmities increased, so that he died in 1735, at the age of 80. His disposition and character were highly estimable. His principal works were, "L'Histoire des Revolutions de Portugal," 1689, 12mo., much commended by Bouhours for its style, though the memoirs upon which it was founded were not worthy of confidence:—"L'Histoire des Revolutions de Suede," 2 vols. 12mo. 1696, which is characterized as an interesting performance; though in this, as well as some other works, the author inclines to the romantic:—"L'Histoire des Revolutions Romaines," 3 vols. 12mo., considered as his principal performance:—"L'Histoire de Chevaliers de Malthe," 4 vols. 4to., and 7 vols. 12mo. 1727, less esteemed than the preceding:—"Traité de la Mouvance de Bretagne:"—"Histoire critique de l'Etablissement des Bretons dans les Gaules," works that have not been popular:—"Origine de la Grandeur de la Cour de Rome, et de la Nomination aux Evêchés et aux Abbayes de France," a posthumous publication. Several of his learned dissertations were inserted in the Memoirs of the Academy of Belles Lettres. The abbé Mably appreciates Vertot highly as an historian, from a preconceived notion that perfect history corresponds very much with epic poetry; but by others he has been deemed a pleasing and eloquent writer, and denominated "The French Quintus Curtius," whilst his style has been extolled, and his manner of treating his subject has been regarded as interesting. Some of the best judges have disputed his thorough knowledge of mankind, and the accuracy of his research. Moreri.

VERTUE, George, an eminent artist and antiquary, of whom we have given an account under the article Engraving.

VERTUMNALIA, among the *Romans*, a festival celebrated in honour of the god Vertumnus, in the month of October.

VERTUMNUS, in *Mythology*, a god who presided over gardens and orchards, honoured among the Etruscans, from whom the worship of this deity was transmitted to the Romans.

Ovid (Met. lib. xiv.) has described the various forms assumed by this deity, in order to obtain the love of Pomona. Some have supposed that Vertumnus, whose name they derive *à vertendo*, because he had power to change his form at pleasure, marked the year and its variations; and thus, they say, he pleased Pomona, by bringing the fruits to maturity. Accordingly, Ovid says that he assumed the form of a labourer, reaper, vine-dresser, and old woman, to represent the four seasons, spring, summer, autumn, and winter.

Vertumnus had a temple and a statue near the market-place at Rome, being represented as one of the tutelary deities of the merchants. To this Horace is supposed to allude, where, addressing his book, he says, "Methinks, my book, you often turn your eye towards Vertumnus and Janus;" that is, you are longing to be handsomely bound, and exposed to sale.

Accordingly Vertumnus, says an ancient scholiast on Horace, "deus est preses vertendarum rerum," *i. e.* "vendendarum ac emendarum."

At the feast instituted in honour of him, he was represented as a young man crowned with different sorts of herbs, dressed in a robe, which reached to his middle; holding fruit in his left hand, and in his right a cornucopia.

The commentators on Ovid say, that he was an ancient king of Etruria, who, by his diligent and successful cultivation of fruits and gardens, obtained the honour of being ranked among the gods. In proof of this, they refer to Propertius, eleg. l. iv. At Rome, in the street called "Vicus Thuscus," was a statue of Vertumnus, of which Cicero speaks, on occasion of Verres' avarice; "who is there but has traced thy avarice all along the way that leads from Vertumnus's statue to the great Circus?"

VERTUS, in *Geography*, a town of France, in the department of the Marne; 15 miles S.W. of Châlons-sur-Marne.

VERU, a comet according to some writers, resembling a spit, being nearly the same as the lonchites, only its head is rounder, and its train longer and sharper pointed.

VERVA, a word used by some authors to express an ivory amulet to be worn for the epilepsy.

VERVAIN, in *Botany*. See Verbena.

The common vervain, or *verbena officinalis* of Linnæus, is very common on the sides of roads, foot-paths, and farm-yards,

yards, near habitations; for although there is scarcely any part of England in which this is not found in plenty, yet it is never found above a quarter of a mile from a house; which occasioned its being called *simpler's joy*, because, wherever this plant is found growing, it is a sure token of a house being near; this is a certain fact, says Miller, but not easy to be accounted for. It is rarely cultivated in gardens, but is brought to the markets by those who gather it in the fields. It is annual, and flowers in July or August.

Vervain was used among the ancients at their sacrifices, and was thought to contain something divine. The Romans, in the beginning of the year, made a present of this herb to their friends. It appears to be the Ιερα βοτανη, or περιστερεων of Dioscorides. It is destitute of odour, but manifests a slight degree of astringency. The root, worn at the pit of the stomach, an infusion, and an ointment prepared from the leaves, are said to produce good effects in scrophulous cases. Morley's Ess. on Scrophula.

But this, says Dr. Withering, wants confirmation from the more rational and less enthusiastic practitioner.

Its sensible qualities, says Dr. Lewis, afford little or no foundation for the abundance of virtues for which it has been celebrated. Its use in medicine seems to have originated from some superstitious idea of its efficacy, when suspended about the neck as an amulet. In order to obtain its virtues more effectually, the vervain was directed to be bruised before it was appended to the neck: and of its good effects thus used for inveterate head-aches, Forestus relates a remarkable instance. In still later times it has been employed in the way of cataplasm, by which we are told the most severe and obstinate cases of cephalalgia have been cured; for which we have the authorities of Etmuller, Hartmann, and more especially De Haen.

Notwithstanding these testimonies in favour of vervain, it has deservedly fallen into disuse in Britain; nor has the pamphlet of Mr. Morley, written professedly to recommend its use in scrophulous affections, had the effect of restoring its medical character. This gentleman directs the root of vervain to be tied with a *yard of white sattin ribband* round the neck, where it is to remain till the patient recovers. He also has recourse to infusions and ointments prepared from the leaves of the plant; and occasionally calls in aid the most active medicines of the Materia Medica. Woodville's Med. Bot.

VERVAIN, *Mallow*. See MALVA and URENA.

VERUDA, in *Geography*, a small island in the Adriatic, near the coast of Istria; 4 miles S. of Pola.

VERUES, in *Ancient Geography*, a people of Africa, in Mauritania Tingitana, S. of the Succosii and of the Macanitæ, according to Ptolemy.

VERVIC, in *Geography*. See WERWIC.

VERVIERS, a town of France, in the department of the Ourthe, situated on the river Weze. It was anciently walled, but when the French were masters of Limburg, they compelled the inhabitants of Verviers to demolish the walls. The body of citizens is represented by seven commissaries, appointed by the magistrates, whose office is for life, independent of the bishop. The inhabitants carry on a very considerable traffic in cloth, which they export to Germany, the northern parts of Europe, Italy, and Turkey; 17 miles E.S.E. of Liege. N. lat. 50° 36'. E. long. 5° 53'.

VERVINS, a town of France, and principal place of a district, in the department of the Aisne; 4 posts N.N.E. of Laon. N. lat. 49° 50'. E. long. 3° 58'.

VERULÆ, or VERULANUM, in *Ancient Geography*, a town of Italy, in Latium, in the country of the Hernici, according to Florus. Frontinus reckons it in the number of Roman colonies.

VERULAM, in *Geography*. See ST. *Alban's*.

VERULAMIA, in *Botany*, received this appellation from the learned Decandolle, now botanical professor at Geneva, in memory of our immortal BACON, baron of Verulam; see that biographical article. That lord Bacon's speculations in natural knowledge may allow us to claim him as a botanist, we are too much interested in the honour of our science to dispute; but we must deeply regret that his real name, so universally known and venerated, was not preferred, to one which serves but to perpetuate the remembrance of his lamentable disgrace. We should, on any future occasion, presume to establish *Baconia*, in preference to the above, as being, in addition to the above reasons, authorized by Linnæan rule and custom. The characters of this genus, in a paper read before the French *Institute*, were communicated by the above author to M. Poiret, from whom we adopt them.—Poiret in Lam. Dict. v. 8. 543.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Rubiaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-shaped, in four obtuse segments. *Cor.* of one petal, funnel-shaped, longer than the calyx; tube cylindrical, shorter than the limb, its orifice beset with hairs; limb in four spreading segments. *Stam.* Filaments four, short, inserted into the upper part of the tube; anthers prominent, linear, twisted after discharging their pollen. *Pist.* Germen superior, nearly globular, umbilicated at the top; style thread-shaped, hardly so long as the anthers; stigma simple, cylindrical. *Peric.* Berry somewhat globular, compressed at the summit, nearly dry, of two cells. *Seeds* solitary, hemispherical, with a cartilaginous albumen, and straight cylindrical embryo.

Eff. Ch. Corolla funnel-shaped, bearded in the mouth. Calyx four-cleft, inferior. Berry of two cells. Seeds solitary.

1. V. *corymbosa*. Decand. Mem. t. 1. unpublished. Poiret n. 1.—Found by Mr. Stadman, in Africa, near Sierra Leone. A *shrub*, differing from all the known genera of this order besides, in having a superior *germen*. It is said to be most akin to GÆRTNERA, but we know not what these writers intend under that name; certainly not what we, in its proper place, have described. The *branches* are cylindrical and smooth. *Leaves* opposite, stalked, crossing each other in pairs, elliptical, entire, smooth on both sides, six or seven inches long, two or more in breadth. *Stipulas* in pairs, entire, scarcely pointed, permanent. *Flowers* in terminal branched *corymbs*, without *bracteas*. *Calyx* wide, obtuse. *Berry* the size of a pea.

VERULUM, VEROLI, in *Ancient Geography*, a town of Italy, in Latium, at a small distance from Alatrium; exhibiting some relics of antiquity.

VERU-MONTANUM, in *Anatomy*. See GENERATION and URETHRA.

VERURIUM, in *Ancient Geography*, a town of Hispania, in Lusitania. Ptolemy.

VERUS, LUCIUS, in *Biography*, a Roman emperor, son of L. Verus, who had been adopted by Adrian, was born about A. D. 131; and on his father's death, in 138, adopted by Titus Antoninus, at the same time with M. Aurelius. In early life Verus neglected all serious studies, and attached himself to amusement and frivolous pursuits; and, therefore, T. Antoninus, at his death in 161, devolved the imperial power solely on M. Aurelius; but this emperor, with an almost unexampled generosity, declared Verus to be an associate

associate in the empire, with the titles of Cæsar and Augustus, and other appendages of imperial authority; consolidating the union by marrying his daughter Lucilla to Verus; nor was the new emperor insensible of the condescension and kindness of his father-in-law. Upon an invasion of Armenia and Syria by Vologeses, king of Parthia, Aurelius, with a view of rescuing Verus from the temptations of the capital, appointed him to the command of an army which marched against this formidable foe. His attachment to licentious pleasure and dissipating amusements disqualified him for a service so important; his march was slow; and on reaching the voluptuous capital, Antioch, in the year 162, he totally neglected all military operations, and for four years devoted himself to almost every species of licentious gratification and idle amusement. At the conclusion of the war, rendered successful by subordinate Roman commanders, he returned to Rome, and partook of a triumph with Aurelius. Such, however, was the pernicious effect of the course he pursued in Syria, that he addicted himself, without restraint, to all the follies and excesses which have disgraced the most profligate and contemptible of the Roman emperors. Cruelty excepted, he vied in vice and folly with Nero and Caligula, or any of the imperial monsters that had preceded him. His virtuous colleague beheld his conduct with regret, and used every effort which wisdom could suggest for restraining and reforming him. With this view, he took Verus with him in the war against the Marcomanni, which commenced in the year 166. The two emperors wintered together at Aquileia; but Verus was soon tired of the war, and when the frontiers were secured from the barbarians, he determined to return to Rome. But upon their route from Aquileia, in the year 169, he was seized with an apoplectic fit, which terminated his life in three days, in the 39th year of his age, and the ninth of his partnership in the empire. Aurelius interred him with magnificence, and culpably lavished all kinds of divine honours upon his memory, whilst in his speech to the senate he expressed his satisfaction that death had removed an impediment to his designs and efforts for promoting the public welfare. Crevier.

VERY LORD and VERY *Tenant*, are those that are immediate lord and tenant to one another. See LORD and TENANT.

VERZELLINO, in *Ornithology*, the name of a bird common in Italy, and kept in cages for its singing, called by authors *citrinella*, and *thraupis*.

VERZINO, in *Geography*, a town of Naples, in Calabria Citra; 3 miles S.W. of Umbriatico.

VERZUOLO, a town of Piedmont, late France, in the department of the Stura, situated in a fruitful soil and salubrious air, near the Vratia. The country about it seems an agreeable garden, covered with fruit-trees, vines, pulse, &c. It is surrounded with an ancient wall, and flanked with towers. It has two parish-churches, besides several chapels and religious houses. It has also a castle or palace; 2 miles S. of Saluzzo.

VERZY, a town of France, in the department of the Marne; 9 miles S.E. of Rheims.

VESALIUS, ANDREW, in *Biography*, a very eminent anatomist, was born at Brussels in 1513 or 1514; pursued his classical studies at Louvain, and with a view to medicine and anatomy, frequented the schools of Cologn, Montpellier, and Paris, attending, in the last-mentioned capital, the lectures of Gunther and James Sylvius. Upon occasion of the war between Francis I. and Charles V. he was obliged to quit Paris, and in the Low Countries he served as physician and surgeon in the imperial troops from 1535 to 1537. In the latter year he removed to Padua, and taught anatomy there with great applause till the year 1543. He afterwards delivered lectures in the schools of Bologna and Pisa, and in the beginning of 1544, he became physician to Charles V., and resided chiefly at the imperial court. In the midst of his career of professional reputation, a singular circumstance occurred. Being summoned to examine by dissection the body of a Spanish gentleman who died in 1564, and too precipitately commencing the operation, a palpitation was observed in the heart of the subject. This incident being known to the family, Vesalius was accused before the Inquisition, and in order to avert some dreadful sentence, Philip II. interposed, and procured injunction of a pilgrimage to the Holy Land as an expiatory penance. Accordingly the unfortunate anatomist went first to Cyprus, and from thence to Jerusalem. During his abode in that city, he received an invitation to occupy the chair of anatomy at Padua. Having, as it is supposed, accepted this invitation, the vessel in which he was returning to Europe was wrecked on the coast of Zante, on which island he died in 1564, about the 50th year of his age. A jeweller of the island procured an honourable interment for his remains in the church of the Holy Virgin at Zante.

Vesalius has been represented as the first person who rescued anatomical science from the slavery imposed upon it by deference to ancient opinions, and who led the way to modern improvements. His first publication of note was a set of anatomical tables, entitled "Suorum de Corporis Humani Anatome Librorum Epitome," Basil, 1542, fol. max. The plates were for the most part given again in his great work, "De Corporis Humani Fabrica, Lib. VII." Basil, 1543, fol. which has been frequently reprinted in several countries. He is most correct, says one of his biographers, in the bones, muscles, and viscera; the muscles, says Haller, he describes more accurately than any other writer, to the time of Winslow. The earliest impressions of the plates are considered as the most valuable; but the author corrected his explanations in the second Basil edition, 1555. His treatise "De Radicis Chinæ usu Epistola," published in 1546, contains a severe critique on the anatomy of Galen, and a correction of his errors; and his reply to the defence of Galen by Fallopio is the subject of his "Anatomicarum Gabrielis Fallopii Observationum Examen," 1561. The medical and chirurgical writings of Vesalius are held in no high estimation. His paraphrase on the 9th book of Rhazes, published in 1537, is a compendium of medical practice. After his death, his disciple, Borgarucci, published "Chirurgia Magna" under his name, a work scarcely worthy of its alleged author. An edition of all the anatomical and chirurgical works of Vesalius, with fine plates, was published under the care of Boerhaave and Albinus at Leyden, 1725, 2 vols. folio. Haller. Tiraboschi. Eloy. Gen. Biog.

VESBOLA, in *Ancient Geography*, a town of Italy, in the vicinity of the Ceraunian mountains, about 60 stadia from Trebula, and 40 from Suna, attributed by Dionysius Halicarnassus to the Aborigines.

VESCAVATO, in *Geography*, a town of the island of Corsica; 9 miles N.E. of La Porta.

VESCI, in *Ancient Geography*, a town of Hispania, in the interior of Betica, at the foot of mount Illipula, belonging to the Turduli.

VESCIA, a town of Italy, in Ausonia. Steph. Byz. Livy mentions this town and its territory.

VESCIS, a port of Hispania Citerior.

VESCONTE, in *Geography*, a town of Naples, in Calabria Ultra; 3 miles N.W. of St. Severina.

VESCOVATO, a town of Italy, in the department of the Upper Po; 8 miles N.N.E. of Cremona.

VESCOVIO, or VESCOVIO DI SABINA, a town of the Popedom, in the province of Sabina; 12 miles S. of Narni.

VESCOVO, LA, a town of Naples, in Principato Citra; 14 miles W.S.W. of Amalfi.

VESERIS, in *Ancient Geography*, a place of Italy, in Campania, on the plains at the foot of mount Vesuvius. Livy says that it was in this place that Decius devoted himself to the gods Manes, on occasion of a battle between the Romans and Latins.

VESICA, in *Anatomy*, a bladder; a membranous or skinny part in which any humour is contained.

VESICA *Bilaria*. See GALL-*Bladder*.

VESICA, among *Chemists*, is a large copper vessel tinned on the inside, used in distilling ardent spirits; so called, as resembling the figure of a blown bladder.

VESICÆ *Sphincter*, in *Anatomy*. See SPHINCTER.

VESICARIA, in *Botany*, a genus of Tournefort's, thus named from the bladdery appearance of its very large inflated seed-vessel.—Tourn. Cor. 49. t. 483.—Linnæus reduces this plant to *Alyssum*; see that article, n. 16. Tournefort makes a singular remark, that "if the root were fleshy, it would belong to the same genus as *Leontopetalon*;" see LEONTICE. He subsequently perhaps discovered it to be a true cruciform flower, as it undoubtedly is. No other botanist seems to have met with this plant; though Willdenow, like ourselves, had seen a dried specimen, and he finds fault, we think unjustly, with the figure. Tournefort met with this species in a bare and uncultivated valley of Armenia, not far from Baiboul, early in June. The *root* is woody, and appears to be perennial, crowned with tufts of linear, channelled, toothed, nearly smooth, bright-green *leaves*, not an inch long. *Stems* three or four inches high, simple, clothed with smaller, more entire, leaves. *Flowers* corymbose, small, yellow. *Pouch* somewhat ovate, inflated, four-sided, an inch long, and nearly as broad, membranous, smooth, with four longitudinal angles and ribs, and many reticulated veins, pale-green, purplish on one side, crowned by the permanent style. It consists of one cell, with two opposite, linear, marginal, membranous receptacles, into which the three or four oval *seeds* are inserted.—All things considered, we cannot but think this plant entitled to rank as a genus by itself, nor is the name exceptionable. Though not furnished with materials to draw up its full generic character, we can give the essential distinctions.—Class and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosæ*, Linn. *Cruciferæ*, Juss.

Eff. Ch. Pouch inflated, quadrangular, acute, of one cell, with two linear marginal receptacles. Seeds several.

1. V. *dentata*. Toothed Bladder-cress. (V. orientalis, foliis dentatis; Tourn. Cor. 49. Voyage, v. 2. 109, with a plate. Alyssum Vesicaria; Linn. Sp. Pl. 910. Willd. Sp. Pl. v. 3. 470. Mill. Dict. ed. 8. n. 9.)—Native of Armenia. It is scarcely necessary to remark, that Miller merely adopted this plant from Tournefort, without having seen it alive, nor can we discover his authority for saying the *stems* spread on the surface of the ground. They appear by our specimen, as well as by Tournefort's figure, to be upright.

VESICATORY, VESICATORIUM. See BLISTER, CANTHARIDES, and EMPLASTRUM.

Vesicatories are a stronger sort of sinapisms, and a kind of potential cauteries.

VESICULA, VESICLE, a diminutive of *vesica*; signifying a little bladder.

The lungs consist of vesiculæ, or lobules of vesiculæ, admitting air from the bronchiæ; and not only air, but alf dust, &c.

There are several parts in the body which bear this appellation; as,

VESICULA *Fellis*, *Cistula Fellis*. See GALL-*Bladder*.

VESICULÆ *Seminales*. See GENERATION.

VESICULÆ *Seminales*. These vessels are very evident in fish; the females of most fish have double ovaria, though in some they are single, as in the osmerus, and perca fluviatilis of Bellonius; but the vesiculæ seminales in the males are two in number in all fish, not excepting the males of those here mentioned. They differ, however, very much in regard to their figure and situation. As to their situation, they in some fish occupy almost the whole length of the abdomen, as in the spinose kinds in general, and in the petromyzum, acipenser, and many of the other cartilaginous kinds. In some fish, they are placed only in the lower part of the abdomen, as in the cetaceous kinds, &c. As to figure, in the generality of fish they are oblong and compressed, but in some they are round, as in the cetaceous kinds. The other parts of generation are wanting in most fish. Artedi's Ichthyology.

VESICULÆ *Adiposæ*. See ADEPS, and CELLULÆ *Adiposæ*.

VESICULAR GLANDS. See GLANDS.

VESIDIA, or VERSIGLIA, in *Ancient Geography*, a small river of Italy, in Etruria.

VESINNE, in *Geography*, a town of France, in the department of the Yonne; 10 miles S.E. of St. Florentin.

VESIONICÆ, in *Ancient Geography*, a place of Italy, in Umbria, S.W. of Iguvium.

VESIRE, in *Geography*, a river of France, which runs into the Lignon, near its union with the Loire.

VESLE, a river of France, which runs into the Aisne, near Veilly.—Also, a river of France, which runs into the Saône, opposite Varenne-le-Grand.

VESLING, JOHN, in *Biography*, a physician, anatomist, and botanist, was born at Minden, in Westphalia, in the year 1598; and having studied medicine at Padua, he travelled into Egypt, and upon his visit to Jerusalem, he became a knight of the Holy Sepulchre. Upon his return, he was appointed, in 1632, to occupy the first chair of anatomy at Padua, lecturing also in surgery and botany, and in 1638 superintending the botanical garden. In order to enrich this garden, he travelled to Candia, and other parts of the Levant, where he collected a large number of rare plants. At length, exhausted by his labours, he died at Padua in 1649, at the age of 51 years. As an anatomist, he published "Syntagma Anatomicum publicis Dissectionibus diligenter aptatum," Patav. 1641, and again with additions and figures, Patav. 1647; a work which has been often reprinted and translated into various languages, and which, though for the most part a compilation, contains new observations, especially pertaining to the organ of hearing. A posthumous work, entitled "De Pullitione Ægyptiorum, et aliæ Observationes Anatomicæ, et Epistolæ Medicæ posthumæ," Hafn. 1664, is highly commended by Haller, and contains some curious observations on the hatching of eggs in Egypt, and evolution of parts of the chick, the anatomy of the viper, crocodile, and hyæna, the human lacteals and lymphatics, &c. His principal publications in botany were, "De Plantis Ægypti Observationes, et Notæ ad P. Alpinum," Patav. 1638; "Opobalsami Veteribus cogniti Vindiciæ," Patav. 1644; and "Catalogus Plantarum Horti Patavini," Patav. 1642–1644. Haller. Eloy.

VESLY, in *Geography*. See VEILLY.

VESOUL, a city of France, and capital of the department

ment of the Upper Sâone, situated on a mountain, called Mott de Vesoul: near it is a medicinal spring; $5\frac{1}{2}$ posts N. of Besançon. N. lat. 47° 38′. E. long. 6° 14′.

VESPA, *Wasp*, in *Entomology*, a genus of the Hymenoptera order of insects, the characters of which are these: the mouth horny; the jaw compressed, without proboscis; the palpi or feelers four, unequal, filiform; the antennæ filiform, the first joint being longer and cylindric; the eyes lunated; the body smooth; the sting concealed; and the upper wings plicated. This is a very extensive genus, comprehending, in Gmelin's System of Linnæus, 159 species; but in the history and arrangement of this species there remains much confusion. We may observe in general, that they are remarkable, like those of the apis, or bee, for the dexterity with which they construct their nests, which in those of many species is of considerable size. We shall confine ourselves, in this article, to a description of two species; *viz.* the *Vulgaris* and *Crabro*.

Vulgaris; or Common Wasp. This has an interrupted small line on both sides of the thorax; a four-spotted scutellum, and the incisions of the abdomen marked with black spots. It is suggested by Dr. Shaw, that the V. vulgaris of Linnæus, which he represents as building its nest under projecting roofs, may not be the same with the common English wasp, so well known to us, which builds its nest under ground; as under the surface of some dry bank. M. Reaumur (Hist. Acad. Sc. Paris, 1719), and Dr. Derham (Phil. Tranf. N° 382. p. 53. or Abr. vol. viii. p. 404.), agrees in distinguishing three sorts of wasps; *viz.* the queens or females, the males, and the common labouring wasps, called mules, which, according to Reaumur, are neither males nor females, and consequently barren. The queens, of which there is a considerable number, though fewer than the males, and of course much fewer than the neutral or labouring wasps, are much longer in the body, and larger than any other wasp: they have a large heavy belly, corresponding in size to the prodigious quantity of eggs with which they are charged. The males are less than the queens, but longer and larger than the common wasps, which are the smallest of the species: they have no stings, with which both the queens and common wasps are furnished. There are in one nest two or three hundred males, and as many females; but their number depends on the size of the nest; and Dr. Derham observed that the males were bred, or at least mostly resided, in the two cells or partings, between the combs, next to the uppermost cell. The antennæ or horns of the male wasps are longer and larger than those of either of the other sorts; but the chief difference, says Dr. Derham, consists in their parts of generation, which are altogether different from those of other wasps.

The mules are the labourers belonging to the nest, and are employed in procuring materials for the nests, and in constructing them, and also in furnishing the other wasps, and the young, with provisions.

M. Reaumur has observed, that when the females that have survived the winter begin, at the return of spring, to lay their eggs, they first lay those which hatch mules, and at this time they build cells of a smaller size to lodge the eggs from which they are produced: they afterwards build larger cells, and fill them with the largest eggs, which are those of the males and females. This writer says, that the copulation of the males and females is visible, and he has given a particular account of it; observing that it is performed in October, like that of all other flies.

At the beginning of winter the wasps destroy all the eggs, and all the young ones without exception; all the mules and males which have been employed in this work, being unfurnished with provisions, perish; and none survive, except some few females, which, according to Reaumur, were fecundated in October, and raise a new colony in the beginning of spring.

The wasps construct regular combs, and rear their young in the cells of these combs, in the manner of bees: wherever there is a young worm in a cell, the old wasps frequently thrust their heads into it, and cast up the food, being a coarse kind of honey, for the young one out of their mouths: their cells are hexagonal; and when they have a mind to enlarge their habitations, and make more or bigger combs in them, they are seen very busily coming out of the mouth of the hole, every one loaded with a parcel of earth, till they have carried out as much as is necessary for the intended enlargement.

They support their combs, one over another, by cross-pieces of about an inch long, so that there is ample room for the wasps to pass in their several businesses. Those cells which stand in the centre of a comb are always perpendicular; the others all stand more or less obliquely; and in the centre, the comb is somewhat hollowed and depressed on the face, and convex on the back; and in this part is inserted the principal cross-piece that serves for a support.

A wasp's nest is commonly round, or oval, measuring about ten or twelve inches in diameter, and made of materials resembling the coarser kinds of whitish-brown paper. These materials consist of the fibres of various dry vegetable substances, agglutinated by a tenacious fluid, discharged from the mouths of the insects during their operations. The common covering of it, which is formed of several leaves or layers, with intermediate spaces, is pierced by two holes at a distance from one another, one of which is used for the entrance of the wasps, and the other only for their exit. The space within this covering is cut by a number of horizontal planes, with intervals between them of the size of about half an inch; they are suspended from one another by ligaments, and attached to the covering by their edges; they all have hexagonal cells in their lower surface.

The eggs, larvæ, or maggots of the wasp are of an oblong form, and resemble those of a common fly, but they are larger; they are always fastened to the angles of a cell, never to the sides of it. They are usually placed single: it is very rare to find two in one cell; and, if they are laid so, it seems that only one succeeds; for there is never found more than one worm in a cell.

The heads of all the nymphs are turned toward the centre of the comb, and their tails go obliquely downward toward the base of the cell. They are continually seen opening their mouths, and moving their forcipes, seeming ever hungry, and impatiently waiting for food from their parents. The cells are left open till the nymph is at its full growth; then the wasps cover it over with a thin lid, under which the worm undergoes its transformation; and as soon as it arrives at the wasp state, it eats its way through this thin cover, and comes to work with the rest.

The wasps do not, like bees, prepare and lay up a store of honey for winter use, but the few which survive the season of their birth remain torpid during the colder months. Wasps in general are both carnivorous and frugivorous.

Crabro; or Hornet. This has its thorax black on the fore part, and unspotted, having the incisures of the abdomen marked with a double contiguous black spot. This species is of a much more formidable nature than the common wasp, and of considerably larger size: its colour is a tawny yellow, with ferruginous and black bars and variegations. The nest of this species is generally built in the cavity of some decayed tree, or immediately beneath its roots; and not unfre-

frequently in timber-yards, and other similar situations. It is of smaller size than that of the wasp, and of a somewhat globular form, with an opening beneath; the exterior shell consisting of more or fewer layers of the same strong paper-like substance with that prepared by the wasp: the cells are also of a similar nature, but much fewer in number, and less elegantly composed. The hornet, like the wasp, is extremely voracious, and preys on almost any kind of fresh animal substances which it can obtain, as well as on honey, fruit, &c. &c. Its sting is greatly to be dreaded, and is often productive of very serious consequences.

A highly elegant wasp's-nest is sometimes seen during the summer season, attached, or hanging as it were, by its base to some straw or other projecting substance, from the upper part of unfrequented buildings or outhouses. It does not much exceed the size of an egg, but is of a more globular form, and consists of several concentric bells, with considerable intervals between each, the interior alone being entire, and furnished with a small round orifice; the rest reaching only about two-thirds from the base of the nest. In the centre of the complete or entire bell is situated the congeries of cells, built round a small central pillar attached to the base: the cells are not very numerous, and their orifices look downwards. This nest is attributed by M. Latreille, in the work entitled "Annales du Museum National d'Histoire Naturelle," No. 4. to the Vespa Holsatica of Fabricius, and appears to be found both in England and France, as well as in many other parts of Europe. Shaw's Zoology, vol. vi.

Mr. Ray mentions a peculiar species of wasp, which builds a much smaller nest. This is usually fixed to a beam of some old building, and has only one aperture, which is about half an inch wide, and serves for the wasps to go in and out at. This aperture is always exactly opposite to that part of the hive where it adheres to the beam. The hive or nest is covered with a thin membranaceous substance resembling paper, of a brown colour, with streaks of white, disposed in regular circles. The whole nest is about three inches in diameter, and is usually composed of about nine crusts; when these are cut away, there appears a round comb in the centre, and a smaller above it, fixed up by a pedicle arising from the centre of each. In every one of these cells, which are hexagonal, as those of the common wasp, is reared one worm, which, in fine, becomes a wasp.

The species of wasp which builds in this manner differs from the common wasp in that it is somewhat larger; it is smoother also, and has rings of a deeper yellow on the back: the black spots are not so regular in this as in the common wasp; and the forehead in this is of a perfect yellow, without any spots. These marks, with the difference of hanging a small nest against a beam, and building a large one in the ground, are sufficient to distinguish this as an absolutely different species. Besides these two, Mr. Ray mentions four other species of wasps.

We have an account in the Philosophical Transactions, No. 476, of some wasp-nests made of clay in Pennsylvania.

M. Reaumur, in his History of Insects, vol. vi. mentions clay-nests from St. Domingo, somewhat different from these.

The common wasp has four wings and six feet; its body is yellow, with black triangular spots: the common wasp breeds in the ground.

There is another kind much more fierce, but very rare: these breed in woods and mountains; they are larger, and have broader bodies, and much more black about them; their sting is so large, that it seems disproportioned to the size of their bodies. The application of vinegar is said to be good against their stinging.

To these are to be added the ichneumon wasps, which are smaller than the others, and have very slender bodies, but of the same colours with the common kind; these usually live in the holes of mud-walls, and make a sort of porch of mud before the doors of their habitations.

Of this insect, Mr. Ray mentions not less than thirty-two species; the greater part of which are common on the sides of mud-banks in the borders of fields. These have all slender bodies, and are armed with stings.

The origin of this creature is very strange; it is usually found issuing from the body of the common cabbage caterpillar; the occasion of which is this: the parent fly strikes her tail through the skin of the back of this caterpillar, and deposits her eggs in the creature's flesh. The eggs hatch into small maggots of the carnivorous kind; and these prey upon the flesh of the caterpillar till they arrive at their full growth: the creature that supports them keeping itself alive all this time by the vast quantities of nourishment it is continually taking in. At length, when these worms are arrived at their full growth, they spin themselves a web, under which they change into chrysales, and soon after come out in form of the fly that laid the egg. This is not peculiar to this single species of fly; but many are formed thus in the bodies of caterpillars of several kinds: some of these spin their webs under the skin of the caterpillar, and eat their way through it, when arrived at their perfect state; but others crawl out while yet in their worm state, after having eaten their full time, and bury themselves under ground in order to spin their webs.

There is also another wasp common about Vienna; this is three times as large as the common kind, and seems of two different species, the one having rough antennæ, and the other smooth: they are both variegated with black and a bright yellow. Mouffet's Hist. Insects, p. 6.

Vespa-*Ichneumon*. See the preceding article.

VESPASIÆ, in *Ancient Geography*, a place of Italy, in the country of the Sabines, on the summit of a mountain, six miles from Nursia. Many monuments indicating the antiquity of the Vespasian family, are found in this place, according to Suetonius.

VESPASIAN, Titus Flavius Vespasianus, in *Biography*, a Roman emperor, was born near Reate, in the country of the Sabines, A.D. 7, and brought up by his paternal grandmother near Cosa, in Tuscany. In the year 38 he was edile, and disgraced himself by his adulation of the tyrant Caligula: actuated by the same mean spirit, he married Domitia or Domitilla, the mistress of a Roman knight. In the reign of Claudius he distinguished himself by the command of a legion, obtained for him by the interest of Narcissus, first in Germany, and afterwards in Great Britain, and he was rewarded for his services by the triumphal ornaments, a double priesthood, and at last a consulate. During the early years of Nero's reign he lived in retirement, but at length he was appointed proconsul of Africa; and in this office he incurred the detestation of the people, according to Tacitus, whereas Suetonius says, that he discharged his duties with integrity and dignity. By way of reconciling these contradictory accounts, it has been stated, that in levying the public impositions on the province he was rigorous, whilst he exacted nothing for himself, and that he administered justice with impartiality. Upon his return he was reduced to pecuniary embarrassments, from which he was relieved by mortgaging his landed property, and by some mean practices. In the attentions expected from a courtier

courtier he was deficient; for he is said to have fallen asleep during one of Nero's public musical performances, and to have thus hazarded his ruin. He accompanied this emperor in his tour to Greece, and A.D. 66, he was appointed imperial lieutenant in the Jewish war. In this station he had full scope for exhibiting his good qualities as a military commander. With three legions, a body of cavalry, and ten auxiliary cohorts, he invaded Judæa, his son Titus serving under him as lieutenant. His progress was irresistible; and after capturing Jotapa and Joppa, and reducing almost the whole of Galilee, he withdrew to Cæsarea, where he witnessed the conflict of two Jewish parties, who were destroying one another. Whilst he was preparing for the siege of Jerusalem, the death of Nero, A.D. 68, presented to him new prospects. As soon as he received intelligence of the accession of Galba, he sent his son Titus to pay homage to the new emperor; but on his journey Titus received an account of the murder of the emperor. This event produced a contest between Otho and Vitellius for the imperial throne. Vespasian declared for Vitellius, who, by Otho's death, was left in possession of the throne. But the new emperor was both hated and despised; and Vespasian's reputation was so generally acknowledged in the East, that in the year 69 he was proclaimed emperor by the legions of Judea, Syria, and Egypt, and his sovereignty was every where recognized. When Italy submitted to his name, Vespasian was at Alexandria; and as the senate and people concurred in his elevation to the imperial throne, he left this city A.D. 70, and hastened to Rome, where his arrival was eagerly expected. He was received with general congratulation and rejoicing; and his conduct confirmed the hopes that were entertained at the commencement of his reign. To the revival of the ancient discipline of the army his first attention was directed; and as soon as he assumed the censorial office, he revised the list of senators and knights, displacing the unworthy, and augmenting the number by the admission of several meritorious citizens. Whilst he restrained luxury by his example and authority, and administered justice with impartiality, he manifested in his general conduct the clemency and mildness of his disposition. He avoided every kind of parade, nor did he ever attempt to disguise the meanness of his origin. With the senators he lived upon easy and familiar terms, receiving and returning their visits; and, as an historian observes, acting the emperor only by his vigilance for the public welfare. The principal blemish of his character was his avarice. Accordingly, he had recourse to various mean and oppressive expedients for raising money. Nevertheless, the wealth which he accumulated by sordid methods was distributed with munificence, in improving the capital and the country, and in providing for poor senators, for literary professors, and for the encouragement of the arts.

If we advert to the public events of his reign, the first year was distinguished by the termination of the rebellion of the Gauls under Civilis, and the capture of Jerusalem by Titus; and in the following year he shut the temple of Janus, and erected a magnificent temple to Peace. In the year 72, Comagene was reduced to a Roman province by the deposition of its king Antiochus. The liberty granted to the people of Greece by Nero, in recompence of their adulation, was restricted A.D. 73, on account of some tumults which occurred, and they were again subjected to tribute and the Roman government. The islands of the Ægean sea were likewise constituted a Roman province, and Rhodes was made the metropolis. The honour of this reign was justly reproached for the death of the virtuous patriot Helvidius Priscus, who, for freedom of speech, and action scarcely compatible with monarchical government, was first banished and afterwards sentenced to death by the senate, a sentence which, it is said, was executed by the contrivance of Mucianus, contrary to the orders of Vespasian. The tragical fate of Sabinus, and his wife Eponina, was very derogatory to the character for clemency by which he was distinguished. (See SABINUS.) Vespasian has also been blamed for the banishment of the Stoic and Cynic philosophers from Rome, under an apprehension that they were enemies to absolute power. This emperor, having enjoyed the benefit of a good constitution to advanced age, was attacked with a fever in the insalubrious climate of Campania, and having drank too copiously of a cold mineral water, he was seized with a complaint in his bowels, which soon reduced him to a state of perilous debility. Apprised of his danger, and jesting upon the usual imperial apotheosis, he said, "In my opinion, I am going to become a god." Afterwards, as he found himself fainting, he attempted to rise out of his bed, observing, that "an emperor ought to die standing." He expired in the arms of his attendants, in June A.D. 79, in the seventieth year of his age, and tenth of his reign; lamented by the Roman people, who under his government had enjoyed several years of peace. Titus, one of his sons, was the great support of his father's throne, and the other, Domitian, was the cause of much trouble and vexation to him. Tacitus. Suetonius. Crevier.

VESPER, in *Astronomy*, called also *Hesperus*, and the *evening star*, is the planet Venus, when she is eastward of the sun, and consequently sets after him. See VENUS.

VESPER, in *Geography*, a small island in the Pacific ocean, about 36 miles in circumference, discovered by Roggewin in 1722; about 60 miles W. of Pernicious island.

VESPERIES, in *Ancient Geography*, a town of Hispania Citerior, belonging to the Varduli; situated N.E. of Flaviobriga.

VESPERS, in the *Romish Church*, *Evening Song*, that part of the office which is rehearsed after noon; answering to our *evening prayers*; except that it differs more from the office of the morning, called *matins*.

VESPERS, *Sicilian*, denote a famous era in the French history; or a general massacre of all the French in Sicily, in the year 1282, to which the first toll that called to vespers was the signal.

Some will have it to have happened on Easter eve; others on the day of the Annunciation; but most authors assign it to Easter day. It is ascribed to one Prochites, a Cordelier, at the time when Charles of Anjou, count of Provence, was king of Naples and Sicily. The women with child by Frenchmen were not spared.

After the like manner we say, *the matins of Moscow*, speaking of the Muscovites assassinating their prince Demetrius, and all the Poles, his adherents, at Moscow, the 27th of May, 1600, under the conduct of their duke Choutsky, at six o'clock in the morning; and *French matins* to the massacre of St. Bartholomew, in 1572.

VESPERTILIO, *Bat*, in *Zoology*, a genus of the order Primates, in the class of Mammalia; which, though ranked by Linnæus in the order of Primates, differs greatly from the rest. The characters of this genus are, that the teeth are erect, sharp-pointed, and approximated; and that the hands are palmated with a membrane surrounding the body, and giving the animal the power of flight. Dr. Shaw observes, that the curious formation of these animals cannot be contemplated without admiration; the bones of the extremities being continued into long and thin processes, connected by a most delicate membrane or skin, capable, from its thinness, of being contracted at pleasure into innumerable wrinkles,

wrinkles, ſo as to lie in a ſmall ſpace when the animal is at reſt, and to be ſtretched to a very wide extent for occaſional flight. The ſpecies of this extraordinary genus are numerous, and may be divided into the *tailed* and *tailleſs* bats. Gmelin, in his edition of the Linnæan Syſtem, enumerates twenty-three ſpecies, and diſtributes them into ſeveral diviſions, according to the number of the fore-teeth in the upper and lower jaw.

* *Bats with four Fore-teeth in both Jaws.*

Vampyrus. Tailleſs bat, with the noſe ſimple, or without any appendage, and the flying membrane divided between the thighs. This is the ternate bat of Pennant; and this, or the variety α of Gmelin, the colour of which is chiefly black, is the V. ingens of Cluſius, the V. volans of Bontius, the chien volant of Daubenton, and rouſſette of Buffon. Gmelin enumerates two other varieties, differing in ſize and colour; one the great bat of Edwards, or rougette of Buffon, and the other the leſſer ternate bat of Pennant. See Vampyre.

Spectrum. Tailleſs bat, with a funnel-ſhaped, ſharp-pointed membrane on the noſe. This is the andira guacu, veſpertilio cornutus of Piſo, the vampyre of Buffon, or ſpectre bat of Pennant. See Vampyre.

Perspicillatus. A tailleſs bat, with a noſe furniſhed with a plane leaf acuminated. This is found in South America, and is ſuppoſed by ſome to be the javelin bat of Pennant.

Spasma. A tailleſs bat, with a doubly heart-ſhaped leaf-like membrane on the noſe. This is the glis volans ternatanus of Seba, and cordated bat of Pennant. The colour is reddiſh-brown; the extent of wing about fifteen inches, and length of body nearly four inches: it is a native of Ceylon and the Molucca iſlands.

Hastatus. A tailleſs bat, with a trefoil-ſhaped upright membrane on the noſe. This is the javelin bat of Pennant, with large pointed ears, a membrane at the noſe in the form of an ancient javelin, with two upright proceſſes on each ſide, cinereous fur, and of the ſize of the common bat: ſynonimous, according to Pennant, with the V. perſpicillatus of Linnæus, and inhabiting the warmer parts of America.

Soricinus. A tailleſs bat, with lengthened ſnout, furniſhed with a heart-ſhaped, leaf-like membrane. This is the leaf bat of Pennant, and bat from Jamaica of Edwards; with ſmall rounded ears, a web between the hind-legs; fur of a mouſe-colour, tinged with red, and ſize of the common bat. Found in South America.

Leporinus. Tailed bat, with the upper lip bifid. This is the Peruvian bat of Pennant. It has a head reſembling that of a pug-dog; the ears are large and ſtraight, ſharp at the ends, and pointing forwards; tail incloſed in the membrane which joins to each hind-leg, and ſupported by two long cartilaginous ligaments, involved in the membrane; colour of the fur iron-grey; body of the ſize of a middling rat, and extent of wing two feet five inches.

** *Fore-teeth in the upper Jaw four, in the lower ſix.*

Auritus. Tailed bat, with ſimple or inappendiculated mouth and noſe, and double ears larger than the head. This is the long-eared Engliſh bat of Edwards, the oreiller of Buffon, and the long-eared bat of Pennant. This very much reſembles the next ſpecies, but is rather ſmaller, and the fur has leſs of the reddiſh tinge; but it is diſtinguiſhed by the very large ſize of the ears, which are more than an inch long, and very conſiderably wide; ſlightly rounded at the tips, and furniſhed internally with a kind of ſecondary auricle or internal flap, ſo placed as to ſerve by way of a valve or guard to the auditory paſſage.

Murinus. Tailed bat, with ſimple noſe, and ears ſmaller than the head. This is the chauve-ſouris of Buffon, the ſhort-eared Engliſh bat of Edwards, and the common bat of Pennant. It is about two inches and a half from the noſe to the tip of the tail, and the extent of the wings, fully expanded, is about nine inches: it is of a mouſe-colour, tinged with reddiſh; the wings and ears black, the latter being ſmall and rounded.

This and the former bats are the two moſt common ſpecies in this country; and they are thoſe which are ſeen fluttering about in the evenings of ſummer and autumn; often uttering a ſharp, ſtridulous note or ſcream during their flight, and purſuing the various inſects on which they feed, particularly moths. They are ſometimes taken by throwing up the heads of burdock whitened with flour, being thus caught by the hooked prickles and brought to the ground. The bat is, like the mouſe, capable of being tamed to a certain degree. Inſects are its favourite food, though it will not reject raw fleſh when offered; ſo that the notion that bats go down chimneys and gnaw men's bacon is not improbable. The vulgar opinion, that bats, when on a flat ſurface, cannot get on the wing again, is erroneous. Bats are commonly ſuppoſed to produce two at a birth, which they ſuckle for a conſiderable time. When recently born, they adhere ſo tenaciouſly to the breaſt of the parent, as not to be removed without great difficulty: they lodge in great numbers in the cavities of old buildings, under the projections of walls, in the hollows of trees, in rocky places, &c. &c. In theſe receſſes they lie torpid during winter, till the warmth of the vernal atmoſphere invites them abroad to make their evening excurſions. When taken torpid, and brought into a warm ſituation, they awake from their ſlumber, and again expand their wings. During their ſtate of torpidity, the circulation of the blood is not perceivable in the ſmaller veſſels, but when awakened by warmth, it becomes viſible by the microſcope. Bats are ſaid to drink on the wing by ſipping the ſurface, like ſwallows, as they play over pools and ſtreams. They are fond of frequenting waters, not only for the ſake of drinking, but on account of the inſects that hover over them. The general appearance of the bat, together with its nocturnal flight, excites the idea of ſomething that is hideous and diſmal; and therefore the ancients conſecrated it to Proſerpine, and conceived it as one of her duſky regions; and hence painters, in their repreſentations of fiends and demons, uſually exhibit them with the leathern wings of the bat. It is alſo no leſs evident, that the larger bats of India and Africa might, by a little poetical exaggeration, ſerve very well in a general deſcription of the fabulous Harpies. Spallanzani, having found that bats would fly in the darkeſt chamber with preciſion, and without touching the walls, diſcovered alſo the ſame exactneſs in their motions, when their eyes were cloſely covered; and he even deſtroyed the eyes and covered their ſockets with leather; and in this ſtate they were equally accurate in all their movements. Similar experiments were tried by ſeveral other naturaliſts with the ſame reſult. In order to account for theſe phenomena, profeſſor Jurin of Geneva makes a variety of pertinent obſervations. Neither the touch, nor ear, nor ſmell, nor taſte, is ſufficient in his opinion to ſupply the want of ſight; but from ſome anatomical inveſtigations of theſe animals, he concluded that a very large proportion of nerves is expanded on the upper jaw, the muzzle, and the organ of hearing; and theſe appeared to him, in a great degree, to account for the extraordinary faculty abovementioned. Mr. Carliſle's obſervations on this ſubject lead us to conclude that the ſenſe of hearing in the bat is extremely delicate, and that this is one of the principal cauſes

of the dexterity with which these animals, even when blinded, avoid objects which would impede their flight. Mr. Carlisle found, that when the external ears of the V. auritus in a state of blindness were closed, it struck against the sides of the room, without being at all aware of its situation. These bats refused every kind of food for four days, as was also the case with others which were preserved in a dark box for above a week. During the day-time they were very desirous of retirement and darkness; and, while confined to the box, never moved nor endeavoured to get out during the whole day, and when spread on the carpet, they crawled slowly to a dark corner or crevice. At sun-set the scene was quite changed; every one of them then endeavoured to scratch its way out of the box; a continued chirping was heard, and no sooner was the lid of their prison opened than each was active to escape, either flying away immediately, or running nimbly to a convenient place for taking wing. When these bats were first collected, several of the females had young ones clinging to their breasts in the act of sucking. One of them flew with perfect ease, though two little ones were thus attached to her, which weighed nearly as much as their parent. All the young were destitute of down, and of a black colour.

Noctula. Tailed bat, with nose and mouth simple; oval ears, and very small valves. This is the noctule of Buffon, and great bat of Pennant. This species is larger than the V. auritus, its extended wings measuring from fourteen to fifteen inches; the length from the nose to the tip of the tail being about four inches and a half; the nose is slightly bilobated; the eyes are small and rounded; the body is fleshy and plump; the shoulders very thick and muscular; the fur very soft and glossy, and of a bright chesnut-colour. This is an inhabitant of Britain and France; and is said to be common in some parts of Russia, sheltering in caverns. It flies high in the air in search of food, and does not skim near the surface, like the smaller bats. It has been found occasionally in great numbers under the eaves of old buildings, and its smell is generally strong and unpleasant.

Serotinus. Tailed yellowish bat, with short emarginated ears. This is the serotine of Buffon; its length from nose to rump two inches and a half. A native of France, and found in Russia.

Pipistrellus. Tailed blackish-brown bat, with convex front and ovate emarginated ears, scarcely longer than the head. The pipistrelle of Buffon and of Pennant. This is a small species, and found in France. The length from nose to rump scarcely an inch and a quarter; the extent of wings somewhat more than six inches.

Barbastellus. Tailed bat, with elevated hairy cheeks, and large ears angulated on the lower part. The barbastelle of Buffon and of Pennant. Length about two inches from nose to tail; extent about ten inches; upper part of the body dusky-brown, lower part ash-coloured; ears broad and long; nose short; cheeks full; and end of the nose flattened. Found in France.

Hispidus. Tailed hairy bat, with channelled nostrils, and long narrow ears. The bearded bat of Pennant; a small species: above reddish-brown; beneath whitish, tinged with yellow; nostrils open; hair on the forehead and under the chin very long; tail included in a very veiny membrane.

**** Fore-teeth in the upper Jaw four, in the lower eight.*

Pictus. Tailed bat, with simple nose, and funnel-shaped appendiculated ears. The autre chauve-souris of Buffon, and striped bat of Pennant. A Ceylonese species, measuring from nose to the end of the tail two inches; above brown; wings striped with black, or with tawny and brown; changing in colour of the body, which is reddish-brown, with the under parts whitish; the nose small and short; the ears short, broad, and pointing forwards.

***** Fore-teeth in the upper Jaw two, in the lower six.*

Nigrita. Tailed yellowish-brown bat, with the fore-part of the head, the feet, and the tail black. The Senegal bat of Pennant, with a long head, nose a little pointed, ears short and pointed, head and body tawny-brown, mixed with ash-colour; under parts paler; the two last joints of the tail extending beyond the membrane; length from nose to rump above four inches; extent of wing twenty-one inches. A native of Senegal.

****** Fore-teeth in the upper Jaw two, in the lower four.*

Molossus. Tailed bat, with pendulous upper lip, and long tail, stretching beyond the connecting membrane. This is the bull-dog bat of Pennant, which has a thick nose; broad and round ears; the upper part of the body of a deep ash-colour, the lower paler; the five last joints of the tail disengaged from the membrane; length above two inches; extent of wings nine and a half. Found in the West Indies.

Gmelin reckons two varieties, one greater, the autre chauve-souris of Buffon, and the other lesser, the autre chauve-souris of Buffon. Found in the American islands.

******* Fore-teeth in the upper Jaw two, in the lower none.*

Cephalotes. Tailed yellowish-grey bat, with large head, extended lips, spiral nostrils, subocular warts, and small ears without valves. This is a native of the Molucca isles: the end of the tail reaches beyond the membrane; the tongue covered with papillæ and minute spines; the claw or thumb joined to the wing by a membrane, and the first ray of the wing terminated by a claw; the head and back of a greyish-ash colour; length from nose to rump three inches and three-quarters; extent of wings about fifteen.

******** Fore-teeth in the upper Jaw none, in the lower four.*

Lepturus. Tailed bat, with tubular nostrils, slender tail, and a purse-shaped cavity on the interior part of each of the wings. This is the pouched bat of Pennant. The colour of the body is cinereous-brown; the under parts paler; length an inch and a half. A native of Surinam.

Ferrum Equinum. Bat with horse-shoe shaped nose; ears without valves; and tail half the length of the body. This is the fer-à-cheval of Buffon. The upper part of the body is deep cinereous; the lower part whitish. Gmelin mentions two varieties, greater and smaller, which may be the male and female, the greater above three inches and a half long from the nose to the tip of the tail, and extent of the wings above fourteen. Found in France, very rarely in England; also about the Caspian sea.

********* No Fore-teeth.*

Noveboracensis. Long-tailed ferruginous bat, with short sharp nose, short round ears, and white spot at the base of each wing. This is the New York bat of Pennant; 2¼ inches long from nose to tail; tail 1 $\frac{8}{10}$ inch; extent of wings 10½ inches; head shaped like that of a mouse; tip of the nose bifid; tail inclosed in a conic-shaped membrane; head, body, and upper side of the membrane inclosing the tail, covered with long soft hair of a bright tawny colour; the wings thin, naked, and dusky, and the bones

bones of the hind legs very slender. A native of North America, and also found in New Zealand.

********* *Number and Order of Fore-teeth unknown to Gmelin.*

Lasiopterus. Tailed bat, with the membrane connecting the feet very broad, and covered on the upper part with hair. The forehead of this species, which is one of the largest, is very prominent and rounded; nose short; general colour ferruginous; the upper part of the wings of a paler cast; the ends and lower parts black.

Lasiurus. Tailed bat, with tumid lips, and broad hairy tail. A small species, of unknown native country, with upright small ears; tail broad at the base, terminating in a point thickly covered with hair; colour reddish-brown.

Dr. Shaw adds the following species, viz.

Auripendulus. Tailed bat, with obtuse nose, and large pendent ears, with pointed tips. This is the slouch-eared bat of Pennant; tail long, included in a membrane, and terminated with a hook; colour above deep chesnut, lighter on the belly, cinereous on the sides; length three inches and four lines; extent of wing fifteen inches. Native of Guiana.

Nasutus. Tailless ferruginous bat, with long nose, sloping at the tip; and long upright rounded ears. This is the great serotine of Pennant; colour of the upper parts a reddish-chesnut; sides of a clear yellow; remainder of a dirty white: length five inches eight lines; extent of wings two feet. A native of Guiana, assembling in great numbers in meadows and other open places; flying in company with goat-suckers in such multitudes as to darken the air.

Speoris. Tailed bat, with a transverse frontal cavity. This is the pit-nose bat, and from Schreber's description appears to be about the size of the common bat, and to resemble it in its general aspect, but differing in colour, which is a pale yellowish ash-brown. Its principal character, though not peculiar to it, is a remarkable transverse concavity situated on the forehead, lined with a naked blackish skin; the nostrils seated in a similar concavity at the tip of the nose. A native of India.

Vespertilio, in *Conchology*, the name of an elegant species of voluta, supposed to have some resemblance to the colour of a bat.

VESPERTILIONUM Alæ, *Bats' Wings*, among *Anatomists*, two broad membranous ligaments, with which the bottom of the womb is tied to the bones of the ilium; they are so called from their resembling the wings of a bat.

VESPERTINE, Vespertinus, in *Astronomy*, is when a planet is seen descending to the west after sun-set.

VESPIVORUS Buteo, in *Ornithology*, a name given by some authors to the bird, called in English the honey-buzzard, from its feeding its young with the maggot worms out of honey-combs. See Apivorus.

VESPOLA, in *Ancient Geography*. See Vesbola.

VESPOLATE, in *Geography*, a town of Italy, in the department of the Gogna; 6 miles S. of Novara.

VESPRIN, a town of Hungary, the see of a bishop; 16 miles S.W. of Stuhl Weissenburg. N. lat. 47° 4'. E. long. 17° 49'.

VESPUCCI, Amerigo, in *Biography*, was the son of a Florentine of noble family, and became famous by giving name to the largest quarter of the world. He was born in 1451, and having been educated under a paternal uncle, he was sent by his father, in the year 1490, to conduct a commercial concern in Spain. At Seville he was informed of the discoveries made by Columbus, and imbibed the desire of distinguishing himself by a similar pursuit. Whether he had been previously engaged in any nautical expeditions has been a subject of controversy, since he has claimed the honour of being the first discoverer of the American continent. Of himself he says, that having been engaged by Ferdinand, king of Spain, to prosecute the discoveries in the New World, he sailed from Cadiz in May 1497, and after touching at the Canaries, arrived in thirty-seven days at a land which he conceived to be Terra Firma; and if this account be true, he must have anticipated Columbus's view of the coast of Paria by a whole year. But this expedition depends merely on his own statement; and if we consider the high estimation in which Columbus was held, in the year 1497, at the court of Ferdinand and Isabella, and that he possessed the privileges of viceroy and governor of all the newly discovered countries, we cannot suppose it credible, that any other person should be employed to prosecute the object above stated. Accordingly it has been generally believed, that Vespucci's account of his first voyage is a mere fiction, or that it is antedated, in order to support his own claims. It has also been disputed, whether in the voyage which he really made in 1499, Vespucci was a commander or merely a passenger. It is most probable that he was a passenger, and that being skilful in astronomy, a science at that time imperfectly understood, he was very useful to the navigators, and much esteemed by them. After his return he resided for some time at Seville; and upon being repeatedly invited to the court of Manuel, king of Portugal, he secretly quitted Spain, and went to Lisbon, where the king engaged him to undertake a voyage of discovery. With this view he had the command of three vessels, and sailed in May 1501, making land 5° S. of the equinoctial line, which must have been Brazil, though he has not mentioned it. Herrera, however, asserts, that at this time he was with Ojedo in the gulf of Darien, and the discovery of Brazil is attributed by the Portuguese to Cabral in the year 1500. But it appears from the testimony of Peter Martyr, a contemporary writer, that Vespucci really sailed in the service of Portugal some degrees to the south of the line. In May, 1503, he proposed in another voyage pursuing his course to the East Indies, but was thrown on the coast of Brazil, and moored in the bay of All-Saints, to which he gave name; and from thence he returned to Lisbon in 1504. Being again taken into the service of Spain, he resided at Seville in 1507, with the title of pilot-major and a yearly pension, in consideration of marking out the tracks to be followed by navigators, with the power of examining all pilots. This employment afforded him an opportunity of connecting his own name with new discoveries; and as he drew charts for mariners, he distinguished the newly discovered countries by the name of "America," as if it were "Amerigo's Land;" so that the true discoverer, notwithstanding the complaints of the Spaniards, was defrauded of the honour that belonged to him. Vespucci, however, cannot vie in the public estimation with Columbus. He is supposed to have died in 1516, and to have been buried on one of the Azores. Vespucci drew up a compendium of his four voyages, which was first published by Simon Grineus, in his "Novus Orbis," at Basil, in 1537, and afterwards in Ramusio's Collections. The Italian originals were afterwards discovered and published by Bandini. Tiraboschi. Gen. Biog.

VESSA, in *Ancient Geography*, a large and flourishing town of Sicily. Phalaris is said to have taken possession of it by stratagem from Tautus, its prince.

VESSAUX, in *Geography*, a town of France, in the department of the Ardêche; 9 miles S.W. of Privas.

VESSEL, VAS, *Vase*, a thing proper to hold or contain liquor. See VAS.

Thus, a ton, or hogshead, &c. are vessels fit to contain ale, wine, &c.

The chemists use a great diversity of vessels in their operations; as copper alembics, with their refrigeratories; worms and receivers; alembics of glass, stone, and earthen-ware; adopters, or small receivers with two necks; aludels, balloons, bottles, glass jars and basons of various sizes; capsules, or dishes of glass, stone-ware, crystal glass, crucible earth, and plate-iron; the cone, crucibles, glass funnels, ingot moulds, matrasses, mortars, muffles, pelicans, retorts, receivers, circulatory vessels, subliming vessels, &c. See each article. See also LABORATORY.

Among anatomists, &c. all the tubes or canals in which the blood, and other juices or humours, are secreted, conveyed, deposited, &c. as the veins, arteries, lymphatics, spermatics, &c. are called vessels.

Some even extend the word vessel to the nerves; as supposing them the conduits of the animal spirits.

VESSEL, a general name given to the different sorts of ships, from the first-rate man-of-war to the smallest, which are navigated with masts and sails. It is, however, more particularly applied to those of the smaller kind. *Plate* VI. will represent most European vessels, with little description. The *first-rate* is a ship of the line, of one hundred guns and upwards, having three decks or tiers of guns; and the *seventy-four* is also of the line, with two decks or tiers of guns. The *gun-vessel* is rigged like a sloop of war, which is the sixth or smallest rate. The *brig* has only two masts, which are rigged like the main and fore masts of a ship, but has a fore and aft main-sail. A *snow* only differs from a brig by having a try-sail, which hoists upon a small mast abaft the main-mast, and thereby can carry a square main-sail. A *ketch* has two masts, similar to the brig, but has no fore-mast, but a main-mast and a mizen-mast rigged as a ship's. The *lugger* has two masts, with square sails that are hoisted by their yards, not in the middle, as vessels in general, but at one-third of their length. *Schooners* are vessels of a similar size to luggers, having two masts, whose main-sail and fore-sail are suspended from gaffs at the head; and the foot stretched out by a boom, like a man-of-war's long-boat. Both luggers and schooners sometimes carry top-sails, as the brig. *Sloops*, or vessels having one mast, have a main-sail, fore-sail, and jib, as the man-of-war's long-boat. Foreign vessels, not rigged like the above, are mostly like the *xebec*; which see.

A vessel is said to be *of three or four hundred tons*; meaning, that it will carry three or four hundred times two thousand weight; or that, when immerged in water, it possesses the space of three or four hundred tons of water; which are equal to the weight of the vessel, and all the loading it can carry.

A vessel is said to *draw ten or fifteen feet of water*; meaning, that when loaden, it sinks so deep under water.

The figure of vessels is an object of great importance, with regard to their motion, sailing, &c.; and in the determining what form is most commodious, the new doctrine of infinites becomes of apparent service to navigation and commerce.

A body moving in an immoveable fluid, is obliged to sever the parts thereof: and they resist such separation.—Now, setting aside a certain tenacity, by which they are, as it were, glued together, and which is different in different fluids; the whole force of the resistance depends on that of the shock, or impulse: for a body that is struck, strikes at the same time; but a perpendicular stroke is that which a liquid resists the most, as being the greatest; and for a body to move freely therein, it must be of such figure, as to present itself as obliquely as possible. If it were triangular, and moved with the point foremost, it is certain all its parts would strike the fluid obliquely; but they would all strike it with the same obliquity; and it were more advantageous that each should strike more obliquely than the next adjacent.

Now, such a perpetual augmentation of obliquity can no where be had in a curve line; each point of which is considered as an infinitely small right line, always inclined to the other little right lines contiguous to it.

To find what curve it is, whose perpetual change of obliquity, or inclination in all its parts, renders it, of all others, the fittest to divide the fluid easily, is a problem much more difficult than it appears to be, and, in effect, is only to be solved by the new geometry; the solution was first given by sir Isaac Newton, in his investigation of the solid of the least resistance.

That author, however, did not publish his analysis; yet the marquis de l'Hôpital [illegible] upon it; and afterwards M. Fatio resolved the same problem, though by a much longer, and more perplexed way. See *Solid of the least* RESISTANCE, SHIP, and SHIP-BUILDING.

VESSELS, *Book of*. See BOOK.

VESSEL *Bay*, in *Geography*, a bay on the E. coast of lake Champlain.

VESSIEGONSK, a town of Russia, in the government of Tver; 48 miles N.N.E. of Tver. N. lat. 58° 20′. E. long. 37° 34′.

VESSIGON, a term formerly applied to the puffy swelling termed *wind-gall* on the legs of animals. It is sometimes written *vession*.

VEST, and VESTITURE. See INVESTITURE.

VESTA, in *Astronomy*, one of the new planets, which was discovered by Dr. Olbers in March 1807, and observed by S. Groombridge, esq. at Blackheath, near London, in April of the same year. For an account of this planet, see PLANET, *Planetary* NUMBERS, and *Solar* SYSTEM.

VESTA, in *Mythology*, one of the principal deities of the Pagans.

Those who have diligently investigated the religion of the Pythagorean philosophers pretend, that by Vesta they meant the universe, to which they ascribed a soul, and which they worshipped as the sole divinity, sometimes under the name of το παν, *the whole*, and sometimes under the appellation of μονας, *unity*. However, fabulous history records two goddesses under the name of Vesta; one the mother of Saturn, and wife of Cœlum, and the other the daughter of Saturn, by his wife Rhea. The first was Terra, or the Earth, called also Cybele, and derived her name Vesta, according to some, from clothing, because the earth is clothed, *vestitur*, with plants and fruits, or, according to Ovid, from the stability of the earth, because *stat vi terra sua*, or it supports itself. Hence the first oblations in all sacrifices were offered to her, because whatsoever is sacrificed springs from the earth; and the Greeks both began and concluded their sacrifices with Vesta, because they esteemed her the mother of all the gods. The second was fire, and Vesta, whose power was exercised about altars and houses, derives her name, according to Cicero, from ἑστια, *fire* or *hearth*. Accordingly the poets frequently use Vesta for fire or flame; as they do Jupiter for air, Ceres for corn, &c. An image of Vesta, to which they sacrificed every day, was placed before the doors of the houses at Rome; and the places where these statues were

were erected were called *vestibula*, from Vesta. This goddess was a virgin, and so great an admirer of virginity, that when Jupiter her brother gave her leave to ask what she would, she besought that she might always be a virgin, and have the first oblations in all sacrifices.

This goddess is called by Horace *æterna Vesta*, and it was in honour of her that Numa erected a temple at Rome, and dedicated virgins to keep a perpetual fire upon her altars, "ut ad simulacrum cœlestium siderum custos imperii flamma vigilaret," as Florus says. One way of representing this goddess, it is said, was in the habit of a matron, holding in her right hand a flambeau or lamp, and sometimes a Palladium, or small Victory. Mr. Spence, however, doubts, whether the figures, that are generally looked upon as Vestas, do really represent that goddess or not. There is nothing, he says, which he has seen, that would not be as proper for one of the vestal virgins, as for the goddess who presided over them. To this purpose Ovid expressly says (Fast. vi. ver. 298.) they had no representations of this goddess: "effigiem nullam Vesta nec ignis habent." And he explains away another passage in the third book of his Fasti, ver. 46. where he speaks of a figure of Vesta. (Polymetis, p. 82.) The titles that are given to Vesta upon medals and ancient monuments are, Vesta the Happy, the Mother, the Saint, the Eternal, &c. The worship of Vesta and of fire was brought from Phrygia into Italy by Æneas and the other Trojans who resorted thither. To this purpose Virgil observes (Æn. lib. ii.) that Æneas, before he left the palace of his father, had taken away the fire from the sacred hearth: "Æternumque adytis effert penetralibus ignem."

Vesta was one of the eight great gods of the Egyptians, often mentioned by Herodotus.

The name Vesta, called by the Greeks ἑστια, was synonimous with the Chaldæan and Persian *Avesta*; and hence, according to the learned Hyde, Zoroaster gave to his famous book on the worship of fire, the name of *Avesta*, or *Abesta*, *i. e.* the custody of fire.

VESTALIA, feasts held in honour of the goddess Vesta, on the fifth of the ides of June; *i. e.* on the ninth day of that month.

On that day, banquets were made before the houses; and meats were sent to the Vestals, to be offered by them to the goddess. See VESTALS.

The asses, that turned the mills for grinding corn, were, on this occasion, led about the city, crowned with flowers, and chaplets formed of pieces of bread; and the mill-stones were likewise decked with garlands and crowns.

The ladies went barefooted in procession to the temple of Vesta; and an altar was erected to Jupiter *the Baker*, *Jovi Pistori*, in the Capitol.

The Vestalia had their names from that of their goddess Vesta.

VESTALS, VESTALES, in *Antiquity*, virgins in ancient Rome, consecrated to the service of the goddess Vesta; and particularly to watch the sacred fire in her temple.

Numa first instituted four Vestals; and Plutarch tells us, Servius Tullius added two more; but Dionysius Halicarnassus and Valerius Maximus ascribe this augmentation to Tarquinius Priscus; which number, six, lasted as long as the worship of the goddess Vesta. The Vestals made a vow of perpetual virginity; their employment was, the sacrificing to Vesta, and keeping up the holy fire in her temple. If they violated the vows of chastity, they were punished with remarkable severity; being shut up, or buried, in a deep pit, or cavern, in a place called "agger et sceleratus campus," with a lighted lamp, and a little water and milk, and there left to be devoured by hunger. If they let out the fire, they were whipped by the pontifex maximus; and the fire was rekindled by the sun-beams. It is said, that they always lighted it anew on the first of March in every year, whether it had gone out or not.

To be secure of their virginity, at their admission, it was provided, that they should not be under six, nor above ten years old. They were chosen by lot, out of twenty virgins, carried by the pontiff to the comitia, for that purpose.

They were only consecrated for thirty years; after which time they were at liberty to go out, and be married. If they continued in the house after that time, they were only to be assistants, in point of advice, to the other Vestals.

The first ten years they were to employ in learning their functions; the ten following they were to exercise them; and the last ten, to teach them to others.

Their order was very rich; both on account of the endowments of the emperors, and of legacies of other persons.

The Vestals had a particular place allotted them at the amphitheatres and games of the Circus. Their vehicle was the carpentum, or pilentum. The veil in which they sacrificed was called *suffibulum*.

At first, they were nominated by the kings; but after the extinction of monarchy, by the pontifex maximus, or high-priest. The eldest of them was called *maxima*, as the first pontiff was *maximus*.

They had divers privileges; disposed of their effects by testament, in their father's life-time; had the same gratification as a mother of three children; and whenever they met a criminal going to execution, they had a power to pardon him. Whenever they went abroad, they had the fasces carried before them, a consul, or the prætor, being obliged to give way to them.

The fire which the Vestals were to watch, was not on an altar, or an hearth, but in little earthen vessels with two handles, called *capeduncula*.

This fire was held a pledge of the empire of the world. If it went out, it was judged a very unlucky prognostic, and was to be expiated with infinite ceremonies. Among the Romans, Festus tells us, it was only to be rekindled by the rubbing a kind of wood, proper for the purpose. But among the Greeks, Plutarch, in the life of Numa, observes, it was to be rekindled by exposing some inflammable matter in the centre of a concave vessel held to the sun. For it is to be noted, the Romans were not the only people who kept the perpetual fire of Vesta, in imitation of the celestial fires; but the Greeks were possessed with the same superstition; particularly the Delphians, Athenians, Tenedians, Argives, Rhodians, Cyzicenians, Milesians, Ephesians, &c.

This order of Vestals is said to have subsisted about a thousand years, *i. e.* from the time of Numa to that of the emperor Theodosius. See SIBYLS.

VESTALS *Ferry*, in *Geography*, a town of Virginia, on the Shennando; 18 miles N.W. of Leesburg.

VESTED LEGACY. See CONTINGENT *Legacy*.

VESTED *Remainder*. See REMAINDER.

VESTIARIUS, VESTIARY, in *Antiquity*, master of the wardrobe; an officer under the Greek empire, who had the care and direction of the emperor's apparel, robes, &c.

The *proto-vestiarius*, or first vestiary, was the grandmaster of the wardrobe. But among the Romans, *vestiarius* simply was only a salesman, or taylor.

VESTIBULE, VESTIBULUM, in the *Ancient Architecture*, a large open space before the door, or entrance, of a house.

Martinius derives the word from *vestæ stabulum*; because the fore-part of the house was dedicated to Vesta. Daviler derives

derives it from *vestis* and *ambulo;* because people there begin to let their trains fall.

The Romans had places called vestibules, at the entrance of their houses, to shelter people obliged to stand at the door from the weather; and we have still vestibules of the like kind, in many old churches, houses, &c. called *porches*.

Vestibules only intended for magnificence, are usually between the court and the garden: these are sometimes *simple;* that is, have their opposite sides equally enriched with arches; and sometimes their plan is not contained under four equal lines, or a circular one, but forms several vancorps, and rear-corps, furnished with pilasters.

Vestibule is also used for a kind of little anti-chamber before the entrance of an ordinary apartment.

Vestibule is also an apartment in large buildings, which presents itself at the entrance into a hall or suite of rooms, or offices. The area, in which a magnificent staircase is carried up, is sometimes called a vestibule. And also when the ends of corridores, or passages, terminate in a room, without being separated from them by doors, either to receive light or air, or for appearance; such rooms are called vestibules.

VESTIBULUM, in *Anatomy*, a cavity belonging to the labyrinth of the ear. See Ear.

VESTIGIA, a Latin term frequently used by English writers, to signify the traces or footsteps any thing has left behind it.

The word is particularly applied to the marks remaining of something antique, gone to ruin by time.

VESTINCH, in *Geography*, a town of Bosnia; 44 miles S. of Bihacs.

VESTINI, in *Ancient Geography*, a people of Italy, regarded as Samnites; but being of Sabin origin, they were sometimes comprehended under the name of Marsi. They were situated between the Prætulii, Marracini and Peligni.

VESTINUS, a mountain of Italy, in the environs of Minturna.—Also, a river of Italy, in Campania, which discharged itself into the Sarnus.

VESTIS Angelia. See Angelic *Garment*.

VESTITZA, in *Geography*, a town of European Turkey, in the Morea; 44 miles E.N.E. of Chiarenza.

VESTMENT. See Vesture.

VESTRY, Vestiaria, a room adjoining to a church, where the priests' vestments, and the sacred utensils, are kept, and parochial assemblies are held.

Hence the term vestry is applied to the parochial assembly itself. On the Sunday before a vestry is to meet, public notice ought to be given, either in the church, after divine service is ended, or else at the church door, as the parishioners come out, both of the calling of the said meeting, and also the time and place of assembling it, and sometimes of the business for which it is convened. And it is usual, for half an hour before it begins, to give notice, by tolling one of the church bells. Anciently, at the common law, every parishioner who paid to the church rates, or scot and lot, and no other person, had a right to come to these meetings, the minister excepted, who is responsible to the bishop, whether he be rector or vicar, for his attendance, and who presides in every parish meeting. Out-dwellers also, occupying land in the parish, have a vote in the vestry, as well as the inhabitants; and when they are met, the major part present will bind the whole parish. The power of adjourning the vestry is not in the minister or any other person as chairman, nor in the churchwardens, but in the whole assembly, to be decided by a majority of votes. Every vestry act, in order to prevent disputes, should be entered in the parish-book of accounts, and every man's hand consenting to it be set thereto. Burn's Eccl. Law, art. *Vestry*.

Vestry-*Men*, a select number of the principal persons of every parish within the city of London, and elsewhere; who yearly choose parish-officers, and take care of its concernments.

They are thus called, because they usually meet in the vestry of the church.

By these select vestries, the parishioners have in some places lost not only their right to concur in the public management as often as they would attend, but also the right of electing the managers. And yet such a custom of the government of parishes hath been adjudged a good custom, as the churchwardens accounting to them has been adjudged a good account. In some parishes, these select vestries have been thought oppressive and injurious, and great struggles have been made to set them aside. Prescription and constant immemorial usage seem to be the basis and only support of these select vestries. In the act of the 10 Ann. c. 11. for building fifty new churches, the commissioners are empowered to appoint a convenient number of sufficient inhabitants to be vestry-men; and from time to time, upon the death or removal, or other voidance, of any such vestryman, the rest, or majority of them, may choose another. In the several private acts for building particular churches, sometimes the minister, churchwardens, overseers of the poor and others, who have served or paid fines for being excused from serving these offices; sometimes the minister, churchwardens, overseers of the poor, and all who pay to the poor rate; sometimes only all who pay a certain sum to the poor rate; sometimes all who rent houses of so much a year, are appointed to be vestry-men within such parishes, and no other persons.

Vestry-*Clerk*, an officer chosen by the vestry, who keeps the parish accounts, and who has the custody of all books and papers relating to them. The beadle is also chosen by the vestry; and his business is to attend the vestry to give notice to the parishioners when and where it is to meet, and to execute its orders as their messenger or servant.

VESTURE, Vestment, a garment or clothing.

In our law-books, it is also used metaphorically; as in *vestura terræ, i. e. segetes quibus terra vestitur;* the corn with which the earth is clothed, or covered.

Vesture *of an Acre of Land*, is the produce on it; or the wood, corn, &c. growing on it. It shall be enquired how much the vesture of an acre of ground, and how much the land, &c. 4 Ed. I. 14 Ed. III. &c.

Vesture, *Vestura*, also signifies a possession, or seisin.

In which sense it is borrowed from the feudists; with whom *investitura* signifies a delivery of possession by a spear, or staff; and *vestura*, the possession itself. See Investiture.

VESUBIA, in *Geography*, a river of France, which runs into the Var; 8 miles N. of Nice.

VESUBIANI, in *Ancient Geography*, a people belonging to Italy, though they were inhabitants of Liguria.

VESULIO, in *Geography*, a mountain of France, in the department of the Stura. It is a part of the Alps.

VESULUS Mons, *Mount Viso*, in *Ancient Geography*, a mountain of Gallia Transpadana, in which was the source of the Padus or Po.

VESUNI, a people of Africa, in Mauritania Tingitana. Pliny.

VESUNNA, afterwards *Petrocorii*, the capital of the Petrocorii, according to Ptolemy. The vestiges of the ancient town, still subsisting at Perigueux, are called *La Visone*.

VESUVIAN, in *Mineralogy*, (*Idocrase*, Haüy,) a mineral originally found in the vicinity of Vesuvius, and classed by some mineralogists with the garnet family, of which it forms a distinct species. It is generally crystallized in four-sided prisms, the edges of which are truncated, forming prisms with eight, fourteen, or sixteen sides, differently terminated by low planes. The sides of the crystals are streaked longitudinally; the terminating planes are smooth. The crystals are generally middle-sized; they occur in groups, or lining cavities of other minerals. Vesuvian sometimes occurs massive. The colour of this mineral is either a liver-brown or reddish-brown, or blackish or yellowish-green. The lustre of the crystals is splendent or vitreous. The fracture is small-grained and uneven. It is more or less translucent. It is sufficiently hard to scratch glass, but is brittle. Vesuvian melts before the blow-pipe into a yellowish translucent glass. The specific gravity varies from 3.36 to 3.42.

The analysis of Vesuvian gives its constituent parts as under:

	From Vesuvius.	From Siberia.
Silex - -	35.5	42
Lime - -	33	34
Alumine - -	22.25	16.25
Oxyd of iron -	7.5	5.5
Manganese -	0.25	
Loss - -	1.5	2.25
	100	100

Vesuvian has been found in various parts of Europe as well as near Vesuvius: the opinions respecting its formation will be referred to under VOLCANIC *Products*.

VESUVIANÆ AQUÆ, in *Ancient Geography*, the name given by Tacitus to a small river of Campania, which watered the town of Neapolis.

VESUVIUS, in *Geography*, a celebrated volcanic mountain in Italy, situated in the kingdom of Naples, about six miles S.E. of the capital. Vesuvius appears an isolated mountain, standing in the middle of a plain, but is considered as connected with the Apennines. The base of the mountain is about 40 miles in circumference; the height is stated at from 3700 to 3900 English feet. Vesuvius has two summits; the most northern is called Somma, the other is properly called Vesuvius. Somma is supposed, with much reason, to have been part of the cone of a larger volcano, in which the present volcanic cone of Vesuvius was formed. "It is impossible," says sir James Hall, "to see the mountain of Somma, which in the form of a crescent embraces Vesuvius, without being convinced that it is a fragment of a larger volcano, nearly concentric with the present cone; which in some great eruption has destroyed all but this fragment. In our own times, an event of no small magnitude has taken place in the same spot: the inner cone of Vesuvius having undergone so great a change during the eruption in 1794, that it now bears no resemblance to what it was in 1785." Transactions of the Royal Society of Edinburgh, vol. vii.

From the building of Rome to the year 79 of the Christian era, a period of seven centuries, Vesuvius appears to have been in a state of profound repose, as no mention is made of any eruption during the whole of that time; and the ancient writers who refer to this mountain always speak of its extraordinary beauty and fertility. There were, however, certain appearances near the summit which left no doubt of its prior volcanic state, and the cities in its vicinity were paved with the lavas of ancient eruptions.

Vitruvius, who flourished in the reign of Augustus, says (lib. ii. cap. 6.) "that Vesuvius had formerly been burning, and had covered all the adjacent country with its fires." Diodorus Siculus, who wrote at the latter end of the same reign, refers to a tradition of a volcanic eruption of Vesuvius seen by Hercules. Strabo, a contemporary writer, describing this mountain, says, "here rises Vesuvius, inhabited through all its delicious fields, the summit alone excepted, which spreads into a barren plain, displaying ashes and caverns formed of burnt rock;" whence it may be conjectured, that this summit was formerly in a state of conflagration, and presented fiery craters, which became extinguished when the materials were exhausted. Silius Italicus, in the time of Nero, says, "Vesuvius, by its fires, had formerly caused great ravages both on the land and at sea."

The first great eruption on authentic record took place in the reign of Titus, on the 24th of August, A.D. 79; and on the same the towns of Herculaneum, Pompeii, and Stabiæ were buried under showers of volcanic sand, stones, and scoriæ. Such was the immense quantity of volcanic sand (called ashes) thrown out during this eruption, that the whole country was involved in pitchy darkness; and according to Dion, the ashes fell in Egypt, Syria, and various parts of Asia Minor. The particulars of this eruption are described in a letter from the younger Pliny to Tacitus: his uncle, the elder Pliny the naturalist, lost his life by this event. He had the command of the Roman fleet on the coast of Campania, and wishing to succour those persons who might desire to escape by sea, and also to observe this grand phenomenon more nearly, he left the cape of Misenum, and approached the side of the bay nearest to Vesuvius. He landed and advanced towards it, but was involved in whirlwinds of sulphureous vapour, in which he expired.

After this period, Vesuvius continued a burning mountain for nearly a thousand years, having eruptions of lava at intervals. The fire then appeared to become entirely extinct, and continued so from the beginning of the 12th century to the beginning of the 16th, a period of about 400 years. Woods were growing on the sides of the crater, and pools of water were collected in its centre. Since the eruption of 1506, it has remained burning to the present time, having violent eruptions of lava and ashes at intervals. These have been more frequent during the last century and the beginning of the present, than at any former period. Of twenty-nine eruptions which took place from the time of Titus to 1800, fourteen occurred in the last century: several have taken place since the commencement of the present century, and the volcano is at this time (1817) in a state of activity.

The eruptions of Vesuvius are always preceded by earthquakes more or less violent and extensive, and by a succession of subterranean explosions, growing louder before the stones or lava are ejected. Sir William Hamilton, the English ambassador to the court of Naples from the year 1766 to the latter end of the century, has given several interesting descriptions of the eruptions that took place under his own observation, which are published in the Transactions of the Royal Society. From 1769 to 1779 there were nine eruptions, many of them considerable. Most of the eruptions of Vesuvius take place from the crater at the summit, but the eruption of 1794, which destroyed Torre del Greco, a city containing 10,000 inhabitants, flowed from a large opening made near the bottom of the cone.

The volcanic products of Vesuvius differ considerably from those of Ætna, and still more from those of the volcanoes in the Lipari islands, more immediately in its vicinity. White pumice and obsidian, a volcanic glass, have not been found

found among the lavas of Vesuvius; but they contain imbedded crystals of leucite, vesuvian, and sommite, which are almost peculiar to this volcano. The lavas of Vesuvius, besides iron, contain also copper, and some of them are said to contain a portion of gold, silver, and other metals. See VOLCANIC *Products*.

Breislak, an Italian geologist, has given an account of the present state of Vesuvius, and an interesting description of the very remarkable eruption of 1794; the most important particulars of which we shall select. This eruption was so great as to change the very form of Vesuvius, as we have before observed.

"The present cone of Vesuvius is truncated, so as to form an inclined plane, sloping from the N.E. to the S.W. The circumference of the summit, which forms the brim of the cauldron, is about 3000 feet; and at the bottom is distinguished an oblong plain, the greatest diameter of which is from E. to W. Having since ascended several times to the top of the cone, I perceived that its depth had gradually diminished, and that the bottom of the crater became higher daily, owing to the different matter which falls down, especially from the almost perpendicular sides on the E. and N. One can at this time easily scan the extent and depth of its mouth, but occasionally it is much encumbered, and sometimes totally clogged. In 1755, the bottom of the funnel rose so considerably, that it presented a vast plain only twenty-three feet beneath the brim, and in the midst of this plain was another cone from eighty to ninety feet high, with a small crater, from which the eruptions proceeded.

"Braccini has left us a curious description of the state of Vesuvius, after a long period of rest, and before the grand eruption of 1631. The whole of it, or at least the greater part of it, had become accessible. Having himself descended into the crater, he says, he found it covered with plants and trees, and that a road down it was practicable for the space of a mile; at this depth a very deep cavern was seen, which having passed, the way was again open for two miles by a very steep but at the same time very safe road, owing to the trees growing near to each other. At length a large plain presented itself, surrounded by a number of grottoes and caverns, which might be entered, but which the party were deterred from on account of their darkness. This plain, which was not accessible otherwise than by a very rapid slope, nearly three miles in length, must assuredly have been much beneath the level of the sea.

"When the volcano is at rest, vapours are seen to arise from the cauldron's brim, or from the interior of its sides, which are very perceptible.

"When the mouth of Vesuvius is observed from any distance, and during the prevalence of moisture in the atmosphere, a mass of vapour seems to rise from it which mingles with the clouds.

"The western portion of Somma must be considered as connected with the cone of Vesuvius by a hill of smaller eminence, denominated Monte Cantaroni, on which is the hermitage del Salvatore. This hill is intersected by three valleys, that deserve to be examined with attention, on account of the quantity of primitive substances which the volcano has thrown thither during old eruptions. The northern valley is that termed La Fossa di Pharaone, near the plain, and Vallone della Vetrana, in its more elevated part, where the current of lava flowed in 1785. This vale, hollowed by rains, is the only interval between mount Somma and mount Cantaroni. South of this vale are two others, nearly parallel, the first called Rio Cupo, the second Fossa Grande, which, taking a direction from east to west, emerge in the plain of St. Jorio. Its northern side, nearly perpendicular, rises to a considerable height above the valley, and being composed only of cemented fragments of porous lava, called capillo, of masses of spongy lava, and other substances of an inadhesive quality, is subject frequently to crumble and fall in large quantities. Along the whole extent of the southern side, at its upper part, is seen an ancient current of lava, which at first sight appears to be several strata of lava imposed one on the other, but which a little attention shews is but one current, in which horizontal chasms have been occasioned by refrigeration, and into which the wind has since introduced a slight quantity of vegetable earth. This lava is hard and compact; it contains but few fragments of augite or pyroxene, and seems to be an assemblage of leucites, the superficial crystalline lustre of which having been impaired by decomposition, makes it resemble variolite in its exterior. Many detached masses of this current have fallen to the bottom of the valley. Each fall of matter brings down calcareous stones, mica, and mixtures of felspar and vesuvian. The lava of 1767, which threatened the villages of La Barra and St. Jorio, discharged itself into this valley, which it filled to a certain height, and afterwards flowed further, spreading itself to the plain. As it is already covered by the crumblings from the flank, in order to examine it, the enquirer must repair to the plain of St. Jorio, in the neighbourhood of the chapel of St. Vito. Its grain is crystallized but fine, and oftentimes so close as to be nearly equal to petro-silex, or horn-stone. It contains many small crystals of pyroxene and fragments of leucite, which is rarely found in its perfect form of crystallization.

"The lava of La Scala passes beneath the garden of La Favorita. It is of the colour of ashes, whitish, and of a crystallized grain. It contains many crystals of pyroxene, few of leucite, and small pieces of felspar, in groups in its cavities. This lava, where it is hewn on the sea-shore near La Cavalleria, is worthy of attention. Under an uniform bed, from fifteen to twenty feet in thickness, the lava is found divided into strata of from three to four feet: these divisions are formed by parallel and horizontal lines; and where these are dug down to, the lava is found to have separated itself spontaneously into beds. Below them are large prisms, commonly hexagonal, which are disjoined with great ease: in some places these prisms, instead of the lower, are found in the upper part of the current.

"The same tendency to a basaltic conformation, which is noticed in the lava of La Scala, is observed again in the neighbouring current of Calastro. This, after passing through a defile below Vallelonga, spreads to a broad front on reaching the sea. What most deserves observation in the lava here are the small crystallizations it presents, which seem to be the olivine of Werner. It is moreover of a deeper colour than the lava of Scala, more porous, and like that contains many crystals of augite and fragments of felspar.

"Next to this lava is found that of the eruption of 1794. Of the different eruptions of Vesuvius, this is the most recent, and was one of the most considerable.

"Vesuvius had continued tranquil for a long time. On the 12th of June, 1794, towards eleven in the evening, a very violent shock of an earthquake was felt, which induced many of the inhabitants of Naples to leave their houses for the night. The tranquillity of the mountain did not, however, appear disturbed, either on the 13th, 14th, or 15th, nor did it exhibit any symptom of an approaching eruption; but towards nine in the evening of the last day many symptoms were manifested. The houses about the mountain experienced violent shocks, which gradually increased in force: a very powerful one was felt at ten o'clock in Naples and its

its environs. At this instant, on the western base of the cone, at the spot called La Pedamentina, and from the midst of ancient torrents, a new mouth disgorged a stream of lava. This opening was 2375 feet in length, and 237 in breadth. Scarcely had the stream of lava begun to flow, before four conical hills, each having its small crater, (the third alone excepted, which had two distinct mouths,) arose out of the stream itself. From these different mouths stones were darted into the air with great noise, and in a state so highly ignited, that they resembled real flames; the explosions indeed were so quickly repeated, that they seemed but one, and formed a continued sheet of fire in the air, which received no other interruption than what was occasioned by the inferiority of force of some of the ejections. They sometimes vomited substances, I may say, in a fluid state, for they expanded in the air like a soft paste, so that one may imagine they were either a part of the running lava, or masses of old lava fused and projected. Some of these hills were contiguous one to the other; and it seems as if the force by which they were produced had met with obstruction to the disgorgement of the substances at one point, and consequently effected several issues in the same line. The lava flowed in one body for some time, and at intervals flashes of light arose from the surface of it, produced by jets of hydrogenous gas, which disengaged itself from the lava, precisely in the same manner as the gases expand from the surface of a fluid. Its first direction was towards Portici and Resina, so that the inhabitants of Torre del Greco already bewailed the fate of their neighbours, and began their thanksgivings to the Almighty for their escape. Collected together in the church, they were still singing hymns of joy, and expressing their gratitude, when a voice announced to them the fatal news of their altered destiny. The stream of lava, on flowing down a declivity it met in its way, divided itself into three branches; one, bearing towards Sta Maria de Pugliano, traversed a space of 2063 feet; another, directing its course towards Resina, flowed to the distance of 3181 feet; while the remainder of the stream, falling into the valley of Malomo, flowed towards La Torre. On reaching the chapel of Bolzano, it formed a branch towards the south-east, which terminated in the territory of Aniello Tirone, after having run the length of 1490 feet; the residue of the lava pursuing its course flowed upon Torre, presenting a front from 1200 to 1500 feet in breadth, and filling several deep ravines.

"On reaching the first houses of the town, the stream divided according to the different slopes of the streets, and the degrees of opposition presented by the buildings. An idea may easily be formed of the accidents consequent on such a flood of fire; accidents which bear relation to the scite of the manufactories, the thickness of their walls, and the manner in which they were assailed by the lava. Had not the mass of the stream suffered a diminution from the different divergencies noticed, not a single house would have been left standing in Torre del Greco. The lava, after a serpentine course through the town, at length reached the sea-shore. The contact with the water diminished the speed of its course: still the current flowed into the sea in a body 1127 feet in breadth, and advanced into it a distance of 362 feet. Its entrance into the sea was not marked by any singular phenomenon; it began to issue from the volcano at ten at night, and reached the sea-shore by four in the morning; continuing a very slow progressive movement into the sea throughout the whole of the 16th, and the following night. The main stream, from the point where it issued from the volcano to that at which it stopped in the sea, measured 12,961 feet. Its breadth varied greatly; in some places it scarcely exceeded 322 feet, but in the plain it spread to 1111; and at a medium, without risk of any great error, it may be computed to have been 725 feet broad. In thickness also it differed according to the depth of the hollows it filled; in the plain it was constantly from twenty-four to thirty-two feet thick: and if its mean thickness be reckoned at the latter number of feet, it may possibly be nearest the truth. According to these data, the mass of molten matter is 1,869,627 cubic fathoms. During the eruption the convulsion of the mountain was so great, that even the houses in Naples were shaken by it. Still it was not constantly alike. At the beginning the trembling was continual, and accompanied by a hollow noise, similar to that occasioned by a river falling into a subterranean cavern. The lava, at the time of its being disgorged, from the impetuous and uninterrupted manner in which it was ejected, by striking against the walls of the vent, occasioned a continual oscillation of the mountain. Towards the middle of the night this vibratory motion ceased, and was succeeded by distinct shocks. The fluid mass, diminished in quantity, now pressed less violently against the walls of the aperture, and no longer issued in a continual and gushing stream, but only at intervals, when the interior fermentation elevated the boiling matter above the mouth. About four in the morning the shocks began to be less numerous, and the intervals between them rendered their force and duration more perceptible. One might compare them to the thunder heard in Italy during storms in summer, the loudest claps of which are succeeded by rumbling sounds, which gradually die away.

"While I was making my observations on this grand eruption at the foot of Vesuvius, its summit was tranquil, and no phenomena were visible about its crater. I passed the night at sea, between Calastro and La Torre, to have a nearer view of this great operation of nature, and to prove the truth of the opinion generally received, that great eruptions are accompanied by extraordinary phenomena in the sea. A more grand spectacle there could not be. On one of those serene and brilliant nights, known only in the delightful climate of Naples, a majestic stream of fire, 11,868 feet in length, and 1483 in breadth, was seen at the foot of Vesuvius; its reflected surface formed in the atmosphere a broad and brilliant aurora borealis, regularly spread and terminated at its upper part by a thick and dark border of smoke, which, dilating itself in the air, covered the disc of the moon, the shining silvery light of which was enfeebled and obscured. The sea again reflected the illuminated sky, the surface of it corresponding with this portion of the atmosphere appearing as red as fire. At the source of this river of fire, inflamed matter was incessantly spouted out to a prodigious elevation, which, as it diverged on all sides, resembled an immense fire-work. On the sea-shore, finally, the mournful spectacle of the conflagration of La Torre completed the picture. The vast clouds of thick black smoke which rose from the town, the flames which occasionally crowned the summits of the houses, the ruins of the buildings, the noise of the falling palaces and houses, the rumbling of the volcano,—these were the principal incidents of this horrible, yet sublime scene. The ruins of Pompeia, buried beneath heaps of drosses and powders, did not certainly present a spectacle near so striking. To these objects, so powerfully calculated to fix the senses, was added another, which forcibly touched the heart: this was a doleful group of fifteen thousand persons, bewailing the destruction of their city and property, who had had but a moment's notice to flee and abandon their homes for ever, and were reduced to become wanderers, and dependent on the world for refuge.

"About dawn, the fummit of Vefuvius ceafed to be vifible: it was covered with a thick cloud, frequently furrowed with lightning. This cloud gradually fpread itfelf, and in a little time overfhadowed the gulf, the city of Naples, and its vicinage. It was formed of a large quantity of that fine fand called afhes, and prevented all fight of the fire of the volcano. The fun, as it appeared above the horizon, prefented a ftill more difmal picture. From the abundance of afhes in the air, it feemed more pale than during the ftrongeft eclipfe; and a black fcarf appeared to be fpread over the whole of the gulf and the country. At the extremity of the horizon, towards the weft, the day was more clear, while the light at Naples was fainter than twilight; and, with Pliny the younger, one might have faid, "Jam dies alibi illic nox omnibus nigrior denfiorque."

"During this mournful night the air was perfectly unagitated, and the fea calm: it was not difturbed even in the flighteft degree, at leaft in the gulf of Naples. The flighteft action of the volcano on it would have been perceptible at the bafe of the mountain, and I was within a diftinct view of this part of the fea; but its influence on that element was abfolutely null.

"While one current of lava flowed over the weftern flank of Vefuvius, fpreading ruin and defolation; another fell down its eaftern flope, from an opening of inferior height, and a greater diftance from the fummit. This current was not vifible at Naples: all that was perceived of it was a great light in the atmofphere, produced by reflection from the rolling fire. At firft it took an eaftern direction, turned afterwards to the fouth, and defcended to the fpot called Cognolo. There it fortunately found the valley of Sorienta, 65 feet wide, 121 deep, and 1627 long. This valley the lava filled; but as the volcano ftill continued to emit frefh matter, the current afterwards fpread into the plain of Forte, near to Pozzelle, where it divided into three branches: one proceeded towards Bofco, another towards Mauro, and the third to the plain of Mulara. The length of this current of lava was not lefs than an Italian mile; but as it flowed conftantly over old lavas, it did but little harm, merely laying wafte and occupying a fmall extent of vineyard. From the fpot where it diverged from its firft direction, it projected a fmall branch in a continued line: falling to this point over a very rapid flope, the fpeed with which it flowed muft have been confiderable; and a portion of its mafs preferving its firft impulfe, naturally fell in this fmall ftream, in which were four mouths in the fhape of an inverted cone, the bafe of which is in the furface of the lava. This ftream terminates in a fmall and regular hill of a conical figure, on the fummit of which are two mouths in form of inverted cones. The dimenfions of this fecond current are nearly half thofe of the firft; confequently the mafs of the whole is adequate to 2,804,440 cubic fathoms.

"The coincidence and perfect refemblance of thefe two currents of lava fufficiently prove that they had but one common origin, and but one cauldron in which the matter was fufed of which they were compofed. How great then muft that recipient be in which fuch an enormous mafs could be contained! And what powerful exertion of ftrength muft have been required to break through the mountain in fuch oppofite directions! The lava agitated by the expanfion of elaftic fluids made its firft efforts to liberate itfelf on the eaftern flank, and found a paffage; but the refiftance it met with from the mountain no doubt occafioned its reflux or rebound againft its oppofite flank.

"The weftern current, taking its departure from a more elevated mouth, more quickly terminated its courfe; but the cauldron chiefly emptied itfelf by the eaftern opening. The lava iffued from it very flowly, compared with the celerity with which that flowed which proceeded from the eaftern mouth, becaufe it was no longer driven forward, or compreffed by the total mafs, which was already greatly diminifhed.

"On the morning of the 16th, the lava ceafed to flow over the weftern fide, and the mouth of the volcano began to refume activity. The whole of its cone was covered with a very thick rain of afhes or powders, which totally hid it from fight, fo that nothing could be diftinguifhed on Vefuvius, which was wholly inacceffible. In this ftate it continued four days, during which many fhocks of earthquakes were felt, and loud claps of thunder were heard. Thunders raged in every part of the adjacent country, and the flafhes of lightning by which they were accompanied at intervals, for an inftant allowed a view of the mountain through the darknefs in which it was involved by the rain of powders. This darknefs was fo prodigioufly great, that at Caferto, and other places ten or twelve miles from Vefuvius, it was impoffible to walk the ftreets at mid-day without torches, and that circumftance was renewed which is related by Pliny on the occafion of the eruption in the time of Titus, "faces multæ, variaque lumina folvebant obfcuritatem." It is utterly impoffible to determine with precifion the quantity of afhes or powders that fell in the courfe of thefe days, as it was different in different places, according to the direction of the wind; it is, however, computed, on the bafe of obfervations at different places, that fourteen inches and fix lines in depth fell on an area, the radius of which is three miles, the fummit of Vefuvius being the centre."

It would be erroneous to conclude, that all this mafs of matter proceeded from the entrails of the mountain, the greater part was the offspring of the ruins of the crater, which during the three laft days fell into the abyfs. For, after the rain of volcanic fand had ceafed, and the mountain became vifible, its appearance excited much furprife, the fummit had fallen, and its mouth was confiderably enlarged.

Inceffant rains followed this eruption, which continued to the 3d of July. Whenever a cloud appeared above the horizon, it feemed attracted by the volcano, and fcarcely did it reach its fummit, ere immenfe ftreams were vifible, precipitating themfelves with horrible roarings to the bafe of the mountain. Thefe impetuous torrents of water, mingled with volcanic powders, overturned the bridges, harrowed up the roads, tore up the trees, and utterly devaftated the fields of one of the moft rich and flourifhing countries in the world. Mephitic vapours were alfo exhaled, which deftroyed all other vegetation, except the olive and the pear-trees, which retained their verdure and ftrength. It is remarkable, that during the whole of this eruption the barometer at Naples was not fenfibly affected, and exhibited no change, although the temperature and moifture of the atmofphere experienced confiderable variation.

Though the quantity of matter thrown out of Vefuvius, during any fingle eruption, is not fo great as from Ætna, Vefuvius being of diminutive fize, compared with the latter mountain; yet the magnitude of fome of the ftones ejected is truly furprifing, and the quantity prodigious. According to fir William Hamilton, during the eruption of 1779, the town of Ottaçano, at the foot of Somma, was half buried under the fhowers of fand and fragments of volcanic matter. A ftone, meafuring one hundred and eight feet in circumference and feventeen feet in height, was thrown a quarter of a mile clear of the mouth of the volcano. One of ninety-two feet in circumference was thrown much farther,

ther, and lay in the valley between Vesuvius and the Hermitage. From the fragments which surrounded this mass, it appeared to have been much larger when in the air. For further observations on the volcanic phenomena of Vesuvius and the adjacent country, see VOLCANO.

VETAS, a town of South America, in New Grenada; 15 miles E.S.E. of Pamplona.

VETAVELUM, a town of Hindoostan, in the Carnatic; 12 miles N. of Tricalore.

VETCH, in *Botany*, a word of one common origin with VICIA; see that article, as well as LATHYRUS, OROBUS, and ASTRAGALUS.

VETCH, in *Agriculture*, a well-known wild plant of the fodder kind, which in some of its sorts promises, from the few trials that have yet been made with it, to be beneficial when cultivated in the field. In this view, it has been suggested, that some of the plants of this kind may be useful to the farmer either as affording a good full pasturage for live-stock, or as supplying large quantities of green food to be consumed in other ways; though nothing satisfactory has hitherto been done in ascertaining how far they may be of superior utility in feeding or fattening, pasturing, and being eaten green in the cut state by animals, to fully justify any decision as to their particular merits in any of these modes of application. They are, however, in general, plants that are, in their nature, not only very productive as to the quantity of food, but from many trials, extremely nutritious and fattening in their properties. In addition too, they have mostly the very desirable quality of being fed upon by almost all sorts of live-stock with great avidity; and it is not by any means to be concluded in consequence of their appearing of a coarse nature and quality, that they may not be of advantage even as pasture herbage, as it is now well known that close, hard, judicious feeding or eating down is capable of bringing the coarsest and roughest kinds of herbage into a fine grassy state of produce. Of these wild plants, that which is usually known by the name of bush vetch, is a sort which would seem capable of being introduced as a pasture plant with considerable benefit in different cases. It is asserted by some, that its roots spread much in a lateral manner just under the surface of the soil of the land, and send forth numerous stems or sprouts at the spring of the year, close to each other, which, as they have a broad bushy top, covered with many leaves, a close pile or surface grass is formed without the assistance of any other plant. It is a plant which is not found to rise to any great height of growth; but from its springing up rapidly, after being cut over or cropped and eat off by animals, it would seem not ill suited to the purpose of pasturage. On such lands as are of the more rich and fertile kind, it, however, grows to a good height for the production of hay; but as the stalks rise so closely together, there is some danger of its rotting at the bottom in moist rainy seasons. It affords great abundance of seed, but which is very liable to be destroyed in the pod by insects while in their vermicular or worm state. It is contended by some, that it would appear to succeed best in lands of the clayey kind, where it abounds in foliage pretty much, affording seeds very similar to those of the cultivated plants of this nature. It is stated too in the Transactions of the Bath Society, that it has been found to shoot earlier in the spring than any other plant that is eaten by cattle, and to vegetate late in the autumn, continuing green all the winter. In good rich land, when cultivated in the drill manner, it may, in the second year, it is said, be cut five times, producing at the rate of twenty-four tons the acre of green food, which would be nearly four and a half tons when dry and made into hay.

It is noticed, that the principal difficulty in introducing this plant into field culture, would arise from the seed being so apt to be devoured by the larvæ of a species of attelobus, as Mr. Swayne has fully shewn.

Another sort of this wild plant which might be useful to the farmer in somewhat the same way, is that of the kind usually called the tufted vetch, which, in consequence of its rising to a considerable height in the stem, and affording much foliage, is capable of yielding a large proportion of green fodder for cattle-stock; and from its being easily cultivated, might also be made to afford a great deal of hay. It is therefore equally applicable in pastures and meadows. Plott, in his History of Staffordshire, has indeed long since remarked it to improve the condition of poor lean cattle, more than any other plant then known. There are probably some other sorts of these wild plants that might be usefully grown in the field, if properly attended to by the farmer.

The cultivated plants of this nature are considered under their proper heads. See TARE.

VETCH, *Axe, Securidaca*. See CORONILLA.

VETCH, *Bitter* or *Pea*. See OROBUS.

VETCH, *Bitter*, and *Corn Vetch*. See ERVUM.

VETCH, *Bindweed-leaved*. See LATHYRUS.

VETCH, *Chickling*. See LATHYRUS.

VETCH, *Grass*. See GRASS.

VETCH, *Crimson-grass* See LATHYRUS.

VETCH, *Hatchet, Securidaca*. See CORONILLA.

VETCH, *Clusius's Foreign Hatchet*. See BISERRULA.

VETCH, *Horse-Shoe*. See HIPPOCREPIS.

VETCH, *Kidney*. See ANTHYLLIS.

This is a plant of the weed kind, and is common in lands of the chalky and calcareous sorts, of which sheep are very fond. It affords a yellow dye.

VETCH, *Liquorice*, or *Wild Liquorice*. See ASTRAGALUS.

VETCH, *Knobbed-rooted Liquorice*. See GLYCINE.

VETCH, *Milk*. See ASTRAGALUS.

VETCH, *Bastard Milk*. See PHACA.

VETCH, *Venetian*. See OROBUS.

VETCHLING, in *Botany*, is the English name of *Lathyrus Aphaca*, expressive of its diminutive size. The same appellation is sometimes given, though improperly, to one or two of the smallest species of *Vicia*.

VETCHLING, *Meadow*, in *Agriculture*, a wild plant common in meadow lands, for the cultivation of which a premium has been offered. It bears a large number of succulent leaves, and seems well suited as an addition to the meadow grasses. As it makes good hay, it is probably the most useful in mixture with grasses for this purpose; for though cattle and horses eat it, they do not feed upon it with avidity. It is very prevalent in some districts.

VETCHLING, *Yellow*. See APHACA.

The seeds of this, and of all the other species of vetchling, are nutritious, either eaten in broth, or made into bread. Withering.

VETERAN, VETERANUS, in the *Roman Militia*, a soldier who was grown old in the service; or who had made a certain number of campaigns; and, on that account, was entitled to certain benefits and privileges.

These privileges consisted in being absolved from the military oath; in being exempted from all the functions of a soldier; and in enjoying a certain salary or appointment, &c.

The time of service fixed by the Roman laws was from seventeen to forty-six years; and among the Athenians forty years. The use of the term veteran was not introduced

duced till about the close of the republic; but its origin may be traced to the first distribution which Servius Tullius made of the Roman people into classes and centuries; under which the *centuriæ seniorum*, or old soldiers, were appointed to guard the city. They were afterwards employed to guard the camp, whilst the *centuriæ juniorum* fought in the field of battle. After they had served some years, they were called *veteres*, in contradistinction to the *novitii* or *tirones*. In process of time, those who had served a certain number of campaigns were called veterans, and were exempt from the obligation of military service, except on urgent occasions. See EVOCATI.

The rewards conferred on veterans were at first very inconsiderable, *e. gr.* a few acres of land in a foreign country, where they established colonies; but at length they became immense. Tiberius Gracchus distributed among them the treasures of Attalus, who had made the Roman people his heirs. Augustus also bestowed upon them pecuniary recompence, and almost all his successors augmented their privileges.

In France, the term veteran is still retained for such officers as have held their post twenty years, and who enjoy certain of the honours and privileges affixed thereto, even after they have laid them down.

A veteran counsellor has a voice and seat at audiences, though not at processes by writing. A veteran secretary of the king acquires the privilege, &c. of nobility, to himself, and his children.

VETERINARIA, MULO-MEDICINA, or medicine applied to the diseases of cattle. Whence,

VETERINARIUS, a farrier, or horse-leech.

VETERINARY, a term applied to and signifying that part or department of cattle-medicine, which relates to the treatment and cure of morbid animals of the domestic kind.

VETERINARY *College*, an institution first established, in this country, in the year 1792, at St. Pancras, in the vicinity of the metropolis. It is stated in "Boardman's Dictionary of the Veterinary Art," that the public are indebted for this truly national foundation to the humanity, discernment, and patriotic exertions of a country agricultural society, that of Odiham, in Hampshire; and that the first professor of it was a Frenchman of the name of St. Bel, who had previously distinguished himself as a veterinary anatomist and writer in this country, by dissecting and describing different parts of the famous race-horse Eclipse, so much known and admired for his swiftness.

It is added, that the college is supported by public subscription; that the annual contribution is two guineas, but the payment of twenty guineas at one time constitutes a subscriber for life. In some recent instances, too, the institution has shared, it is said, the bounty of parliament; an important saving having resulted to the nation from the appointment of veterinary surgeons to the different regiments of British cavalry, in consequence of it.

The different views and objects of the college or establishment appear in the statement, printed by the authority of the governors, and given below.

It is said, that the grand object is the improvement of veterinary knowledge, in order to remedy and obviate the ignorance and incompetency of farriers, so long and so universally complained of. For this end, a range of stables, a forge, a theatre for dissections and lectures, with other necessary buildings, have been erected; and a gentleman, properly qualified for the purpose, has been appointed professor, with other requisite officers.

The anatomical structure of quadrupeds and other animals, such as horses, cattle, sheep, dogs, and others, the diseases to which they are subject, and the remedies proper to be applied, are investigated and regularly taught; by which means, enlightened practitioners of liberal education, whose whole study has been directed and devoted to the veterinary art in all its branches, may be gradually prepared, provided, and dispersed over the whole kingdom, on whose skill and experience confidence may be securely placed.

That the pupils to the college, in addition to the lectures and instructions of the professor, and the practice of the stables, at the present enjoy, in consequence of the great liberality of some of the most eminent of the faculty of medicine in London, the advantage of free admission to their medical and anatomical lectures. These pupils, previous to leaving the college, are strictly examined by a medical committee, from whom they receive a proper certificate; and several, examined and approved, have, it is said, already left the college, and are at this time practising in various parts of the country with great success.

That subscribers have the privilege of sending their diseased animals to the college, without further expence than that of their daily food; and that these, in general, form a sufficient number of objects for the practice of the professor and pupils to be tried and exercised upon. That on fixed days, the professor prescribes for animals belonging to subscribers, who find it inconvenient to spare them from home, provided the necessary medicines be furnished and compounded at the college. Subscribers' horses are there also shod at the ordinary price, and new improved modes of shoeing practised in different cases.

And that his royal highness the commander-in-chief having been pleased to appoint a board of general officers to take into consideration the objects of this institution, they have reported the continual loss of cavalry to have been very heavy, in consequence of the almost total ignorance of those who have hitherto had the veterinary department in the army. This report his majesty has approved; and henceforward, to qualify for the military service, a veterinary surgeon must be provided with a regular diploma from the college. A number of gentlemen, subscribers to the institution, attend once a fortnight, for the purpose of inspecting the discipline of the stables, and seeing that the regulations are duly complied with.

These form the most material objects and regulations of the establishment; from which it is evident, that it is capable of being of great use and advantage, if properly directed, and confined to the points which it has principally in view.

VETERNA, in *Geography*, a town of European Turkey, in Bulgaria; 9 miles S.W. of Driftra.

VETERNITZA, a river of Servia, which rises in the Karadagh mountain, and runs into the Morava.

VETERNUS is used, by some physicians, for a lethargy, or other drowsy disease.

VETERSEN, in *Geography*, a town of the duchy of Holstein; 15 miles N.W. of Hamburgh.

VETIL, NEDER, a town of Sweden, in the province of Wasa; 16 miles E. of Jacobstadt.

VETIL, *Ofver*, a town of Sweden, in the province of Wasa; 32 miles E.S.E. of Jacobstadt.

VETINA, in *Ancient Geography*, a town of Italy, in Magna Græcia, supposed to lie between Sybaris and Metapontum; but its exact situation is not known.

VETITUM NAMIUM, in *Law*, imports a forbidden distress. See NAMIUM.

VETITZA, in *Geography*, a river of Walachia, which runs into the Kotmana, 10 miles N. of Rusei.

VETLI-

VETLIANSKOI, a fort of Ruſſia, on the Volga; 32 miles S.E. of Tchernoiyar.

VETLUGA, a river of Ruſſia, which runs into the Volga, near Kozmodemianſk, in the government of Kazan.—Alſo, a town of Ruſſia, in the government of Koſtrom, on a river of the ſame name; 140 miles E. of Koſtrom. N. lat. 58°. E. long. 45° 44′.

VETO, in *Roman Antiquity*, was the ſolemn word uſed by the tribunes of the people, when they inhibited any decree of the ſenate, or law propoſed to the people, or any act of other magiſtrates. See INTERCESSION.

VETOLA, in *Ornithology*, a name uſed by the Venetians, and from them by many others, for a water-bird of the ſcolopax kind, called by Aldrovand the *totano*, and by Geſner the *fedoa ſecunda*. In the Linnæan ſyſtem it is the *ſcolopax limoſa*.

It uſually weighs about nine ounces; its beak is ſhaped like that of the woodcock, and is red all over, except at the end, where it is blackiſh; its neck is grey; its belly and breaſt white; its head of a browniſh-grey, and its back brown; but its rump has a white ring on it; its tail is compoſed of black and white feathers. Ray's Ornithology, p. 216.

VETRALLA, in *Geography*, a town of the Popedom, in the Patrimonio; 9 miles S. of Viterbo.

VETSCHAU, a town of Luſatia; 28 miles S.W. of Guben. N. lat. 51° 47′. E. long. 14°.

VETTICUTTY, a town of Hindooſtan, in the Carnatic; 22 miles W.N.W. of Tritchinopoly.

VETTINGEN, a town and abbey of Switzerland, in the county of Baden; 2 miles S. of Baden.

VETTONA, in *Ancient Geography*, a town of Italy, in Umbria.

VETTONES, a people of Hiſpania, in Luſitania, who extended themſelves from the ſouth towards the north, in the eaſtern part.

VETTONIANA, a town of Vindelicia. Itin. Anton.

VETTONICA, in *Botany*, the ancient way of ſpelling the word *betonica*, the name of a plant, called in Engliſh *betony*.

It is called *vettonica* by Pliny, who ſays it obtained that name from a people of Italy ſo called, among whoſe woods it grew.

If any thing certainly can be judged of the betonica of the ancients, it is that it was our *ſerratula*.

VETTORI, PIETRO, (Lat. VICTORIUS,) in *Biography*, a deſcendant of a noble family at Florence, was born in 1499. Educated at his native city and at Piſa, he viſited Spain, and returned to Italy with a collection of ancient inſcriptions. At Rome he complimented Clement VII. on his acceſſion to the pontificate; and ſettling at Florence, joined the party oppoſed to the houſe of Medici, and ſupported it with his eloquence and arms. Upon the aſſaſſination of Aleſſandro di Medici in 1537, he withdrew to Rome. In the following year, duke Coſmo appointed him public profeſſor of Greek and Latin eloquence at Florence, and he ſuſtained this office with diſtinguiſhed reputation for many years. He was much eſteemed by ſeveral popes, and Marcellus II. drew him to Rome; but upon the death of this pontiff, he reſumed the chair at Florence, and held it nearly to the cloſe of his life. He died in 1585, regretted and eulogized by the learned, on account of his virtuous and amiable manners, as well as his extenſive erudition. Vettori took great pains in improving the editions of the ancient Greek and Latin writers. Of the latter we may mention Cicero, Terence, Varro, and Salluſt; and of the former, Euripides, Porphyry, Demetrius Phalereus, Plato, Xenophon, Dion. Halicarn., Ariſtotle, Æſchylus, and Clemens Alexandrinus. His commentaries upon the rhetoric, poetics, ethics, and politics of Ariſtotle, and upon the elocution of Demetrius Phalereus, are much valued. He was alſo the author of many Italian and Latin letters, and of ſome poems, of an elegant Latin tract on the culture of the olive, and of other pieces in MS. Tiraboſchi. Gen. Biog.

VETULA, in *Ancient Mythology*, a goddeſs who preſided over pleaſures.

VETULONIA, or VETULONIENSES, in *Ancient Geography*, a town of Italy, in Etruria, ſituated towards the weſt, on the ſea-coaſt. It was one of the cities of the Etruſcans, and deſcribed by Silius Italicus as one of the moſt pleaſant of their cities; but it was deſtroyed at the commencement of Rome.

VETULONIUM, a town of Italy, in the interior of Etruria, according to Ptolemy; called *Vetulonia* by Silius Italicus.

VETUSSALINA, or VETUSALINÆ, a town of Valeria Ripenſis, ſituated, according to Anton. Itin., on the route from Taurunum in the Gauls, purſuing the ſhore of Pannonia, between Anamaſcia and Campona.

VEVAY, in *Geography*, the ancient *Vibiſcum*, a town of Switzerland, in the canton of Bern, and the principal town of the bailliage, ſituated near the lake of Geneva. This town is clean and well-built, ſtands on a ſmall plain at the foot of the mountains, on the margin of the water, and is one of the few places in the canton of Bern which carry on any trade. The chief manufacture is that of hats, and the trade in cheeſe is conſiderable. The borders of this part of the lake are much more contraſted, wild, and pictureſque, than thoſe about Geneva; the mountains of the Vallais and Savoy projecting boldly into the water, and forming a ſemicircular chain incloſing the lake, except where they are divided by the Rhone, a few leagues from Vevay. This town was taken from the houſe of Savoy in the year 1474, but ſoon after reſtored. In 1536 it was again taken, and from that time has been attached to Bern. It has a college for the inſtruction of youth, and two churches, one for the French, and the other for the German language. Vevay was diſtinguiſhed as the reſidence of Edmund Ludlow, the famous parliamentary general; and here he found an aſylum from the attempts of his enemies, under the protection of Bern. Here he was interred, and his monument is a plain grave-ſtone of black marble, on which is a Latin inſcription. Over the door of the houſe which he inhabited is ſtill preſerved, from reſpect to his memory, the following uncouth motto:

"Omne ſolum forti patria eſt, quia patris."

Vevay is 10 miles E. of Lauſanne. N. lat. 46° 30′. E. long. 6° 48′.

VEULLES, a town of France, in the department of the Lower Seine; 9 miles N.E. of Cany.

VEURDRE, LA, a town of France, in the department of the Allier; 13 miles N.W. of Moulins.

VEUVEY, a town of France, in the department of the Côte d'Or; 12 miles N.W. of Beaune.

VEXALA, in *Ancient Geography*, an eſtuary of Britain, which is probably the bay at the mouth of the river Brent, in Somerſetſhire.

VEXES. See NE *injuſte vexes*.

VEXILLARII, among the Romans, were veteran ſoldiers, the ſame with thoſe the old Romans called *triarii*. There were ſix hundred of them in every legion.

VEXILLUM, a pair of colours belonging to each century

tury of a Roman legion, for the preservation of which, ten of the best soldiers in the century were allotted; and all those, in the different centuries of a legion, (ten centuries composing a cohort, and ten cohorts constituting a legion,) formed a very choice body of men, which was called the vexillation of that legion, and was sometimes separated from it, and sent upon particular services. The vexillation of a legion was equal in number of men to a cohort, and had an equal proportion allotted to it in the execution of all public works.

Vexillum, in *Botany.* See Standard and Papilionaceous.

VEXIN, in *Geography*, before the revolution a country of France, situated along the river Epte, which divided it into two parts, called "Vexin François," and "Vexin Normand." The principal towns of the former are Pontoise, Chaumont, and Magny, included in the department of the Oise. The capital of the latter was Gisors, in the department of the Eure.

VEXOE, a small island of Denmark, near the north coast of the island of Laland. N. lat. 54° 58′. E. long. 11° 41′.

VEYNE, a town of France, in the department of the Higher Alps; 12 miles W. of Gap.

VEZ de Marban, a town of Spain, in the province of Leon; 8 miles N. of Toro.

VEZEDERINA, a town of European Turkey, in Bulgaria; 36 miles S.E. of Viddin.

VEZELAY, a town of France, in the department of the Yonne. Theodore Beza was a native of Vezelay; 7 miles W. of Avallon.

VEZELIZE, a town of France, and principal place of a district, in the department of the Meurte; 12 miles S. of Nancy. N. lat. 48° 30′. E. long. 6° 11′.

VEZENOBRE, a town of France, in the department of the Gard; 6 miles S.S.E. of Alais.

VEZERE, Le, a river of France, which runs into the Dordogne, at Limeuil.

VEZINES, a town of France, in the department of the Yonne; 4 miles N. of Tonnerre.

VEZINS, a town of France, in the department of the Mayne and Loire; 7 miles N.E. of Collet.—Also, a town of France, in the department of the Aveiron; 6 miles S.W. of Severac le Château.

VEZIRKAR, a town of Asiatic Turkey, in Natolia; 25 miles S.E. of Isnik.

VEZOUZE, a river of France, which runs into the Meurte, about 3 miles below Luneville.

VEZZANO Pietroso, a town of the island of Corsica; 13 miles S.E. of Corte.

UFALE, a town of the state of Georgia, on the Oakfuskee. N. lat. 32° 55′. W. long. 85° 57′.

UFENS, or Oufens, in *Ancient Geography*, a river of Italy, in New Latium, east of the Pontine marsh, which discharged itself into the sea; mentioned by Virgil and Silius Italicus.—Also, a river of Gallia Cispadana, mentioned by Livy.

UFFENHEIM, in *Geography*, a town of Germany, in the principality of Anspach; 18 miles S.S.E. of Wurzburg. N. lat. 49° 37′. E. long. 10° 19′.

UFFINIAC, a town of France, in the department of the North Coasts; 3 miles S.E. of S. Brieuc.

UFFUGUM, in *Ancient Geography*, a pretty considerable town of Italy, in Brutium. Livy.

UFHOLZ, in *Geography*, a town of France, in the department of the Upper Rhine; 17 miles S.S.W. of Colmar.

UFNAU, an island of Switzerland, in the lake of Zurich; about a mile in circumference.

UFTER Geften, a mountain of Switzerland, in the canton of Bern; 23 miles S. of Thun.

UFVERSO, a small island in the Baltic, east of Aland. N. lat. 60° 7′. E. long. 20° 20′.

UGAB, a very ancient instrument of the Hebrews, mentioned by Moses before the deluge. Many wild conjectures have been formed concerning this instrument. It has been construed into an organ by some, who did not recollect that *organ* was the generical name for instruments of all kinds; and it is very improbable that a machine, so complicated as a modern organ of the most simple kind, should have been invented before the delnge. Don Calmet, whose ideas concerning Hebrew instruments are not always happy, thinks the ugab was only a syrinx, similar to Pan's pipe; for all the descriptions tell us that the ugab was a wind-instrument with many pipes. See Syrinx.

UGARA, in *Geography*, a town of Asiatic Turkey, in the government of Sivas; 7 miles W. of Tocat.

UGENA, in *Botany*, so named by Cavanilles, *Ic. Plant.* v. 6. 73. *t.* 594, 595, is the same genus of *Filices*, which Willdenow, in his *Sp. Pl.* v. 77, has called *Hydroglossum*, from ὕδωρ, *water*, and γλωσσα, *a tongue*, alluding to its damp place of growth, and the tongue-like shape of the fructifying parts of the frond. Cavanilles meant to commemorate an excellent Spanish draughtsman, employed to delineate the new plants of the Madrid garden. Whether Willdenow's authority may restore *Hydroglossum*, we cannot here venture to foretell; but the genus in question is established by Swartz under the name of Lygodium (see that article); and Mr. Brown has sanctioned this last appellation, both in his *Prodr. Nov. Holl.* v. 1. 162, and in *Ait. Hort. Kew.* v. 5. 497, which we presume will decide the question.

UGENTO, in *Geography*, a town of Naples, in the province of Otranto; 16 miles S.W. of Otranto. N. lat. 40° 12′. E. long. 77° 8′.

UGERNUM, in *Ancient Geography*, or, as Strabo has it, *Gernum*, a place which lay on the way from Nimes to Aquæ Sextiæ, or Aix.

UGEST, in *Geography*, a town of the duchy of Warsaw, in the palatinate of Rawa; 6 miles S.E. of Rawa.

UGGADE, in *Ancient Geography*, a place marked in the Itinerary of Antonine between Rotomagus and Mediolanum Aulercorum, which is Evreux.

UGGER-ZEHM, in *Geography*, a town of the duchy of Courland, in the gulf of Riga; 33 miles E.N.E. of Goldingen.

UGGIATE, a town of Italy, in the department of the Lario; 5 miles W. of Como.

UGGIONE, or Oggione, Marco da, in *Biography*, was a native of Oggione, in the Milanese, and was born about the year 1480. He was one of the most able scholars of Lionardo da Vinci. Avoiding the minute elaborate finish of his master's smaller works, which was imitated by his fellow pupils generally, and attaching himself to the study of the great principles of the art, he became a skilful painter in fresco. He must have been greatly aided in his progress, by having copied the most renowned and the greatest of Da Vinci's works, the Last Supper, painted in the refectory of the Dominican convent at Milan. Uggione's copy is of the same size as the original, near 30 feet long, and was painted on canvas for the refectory of the Carthusians at Pavia, where it remained till the revolution, when it was removed and sold to a rich grocer at Milan; and is lately brought to this country for public exhibition, and for sale. Lanzi says of it, "that in measure it compensates

penſates for the loſs of the original," and is juſtified by the merit of the work. The characters of the heads appear to have been well rendered, except that of the Saviour. Thoſe of St. John, St. Simon, and St. James, are excellently wrought, the former eſpecially: indeed it appears ſo diſtinctly more complete than any other in colour and character, that one might think the great maſter's hand had been employed upon it. The hands, however, are ill drawn, and tamely executed; and the feet much too large, and out of keeping. The draperies alſo are laboured, and a part is cut off the top of the picture, which injures the perſpective of the room in which the figures are ſeated.

His freſco pictures in the church of La Pace at Milan ſtill preſerve their lines and colours unimpaired: ſome of them are in the body of the church itſelf; but the Crucifixion, his moſt copious compoſition, is in the refectory; a work, Mr. Fuſeli has obſerved, "which ſurpriſes by its variety and ſpirit: few Lombards have reached that degree of expreſſion which ſtrikes here, for the art of its compoſition, and the fancy of its draperies." Of his oil pictures, two of the moſt eſteemed are at Milan, one at St. Paolo in Compito, the other in St. Eufemia; but they are inferior to his freſcoes. He died in 1530, aged about 50.

UGGLIBO, in *Geography*, a town of Sweden, in Geſtricia, on a lake; 16 miles N.W. of Gefle.

UGH, a town of Hungary, near the Theiſſe; 32 miles N. of Zegedin.

UGHELLI, Ferdinando, in *Biography*, an eccleſiaſtical hiſtorian, was born of a good family at Florence in 1595; in his youth entered into the Ciſtercian order, and finiſhed his ſtudies at Rome. After having paſſed through various offices in different monaſteries, he was elected abbot of St. Vincent, &c. at Rome, theologian to cardinal Carlo de Medici, and conſultant of the congregation of the Index. He was alſo domeſtic prelate to pope Alexander VII., who gave him a penſion, augmented by Clement IX. He declined accepting any biſhopric, though ſeveral were offered him, becauſe he preferred purſuing his ſtudies at Rome. Having undertaken to give a ſeries of the biſhops of all the churches in Italy, with an illuſtration of each church, deduced from documents in their reſpective archives, he employed ſeveral perſons to aſſiſt him; and the work was printed at Rome in 9 vols., from 1642 to 1648, under the title of "Italia ſacra, ſive de Epiſcopis Italiæ et Inſularum adjacentium, rebuſque aliis præclare geſtis, deducta ſerie ad noſtram uſque Ætatem, Opus ſingulare." A new edition of this work was begun at Venice in 1717, and completed in 1733, in 10 vols. folio, with conſiderable additions. Ughelli alſo made additions to the lives of the popes by Ciaconius, and publiſhed eulogies of the cardinals of the Ciſtercian order, and thoſe of the Colonna family, and genealogies of the Marſciano and Capiſucchi families. He died at Rome in 1670, at the age of 75. Moreri. Gen. Biog.

UGIA, in *Ancient Geography*, a town of Hiſpania, in the interior of Betica, belonging to the Turdetani, according to Ptolemy; marked in the Itin. Anton. between Aſta and Orippo.

UGIE, in *Geography*, a river of Scotland, which runs into the German ſea, about a mile N. of Peterhead. N. lat. 57° 27′. W. long. 1° 47′.

UGINE, a town of France, in the department of Mont Blanc; 20 miles E.S.E. of Chambery.

UGLIANI, a town of France, in the department of the Dora; 16 miles E.S.E. of Aoſta.

UGLIANO, a ſmall rocky iſland in the Adriatic, near the coaſt of Dalmatia, about 3 miles W. from Zara. The inhabitants ſuffer conſiderably from the want of freſh water. Illyrian ſnails, eſteemed by the Romans as one of the moſt delicate luxuries of their table, abound here. N. lat. 40° 18′. E. long. 15° 16′.

UGLICH, a town of Ruſſia, in the government of Jaroſlavl, on the Volga. The principal trade is in leather and ſoap; 60 miles W. of Jaroſlavl. N. lat. 57° 30′. E. long. 38° 22′.

UGLUM, a town of Sweden, in Weſt Gothland; 16 miles S. of Uddevalla.

UGOD, a town of Hungary; 14 miles N.W. of Stuhl Weiſſenburg.

UGOGNA, or Vogogna, a town of Italy, in the department of the Gogna, on the river Toſa; 15 miles N.W. of Arona.

UGONE, Mattia, in *Biography*, was a native of Breſcia at the commencement of the 16th century, a doctor of laws, and biſhop of Famagoſta, in the iſland of Cyprus. His principal performance is a treatiſe on councils, entitled "Synodia Ugonia," approved by a bull of Paul III. in 1543, and printed at Venice in 1565. Dupin pronounces it one of the beſt and fulleſt treatiſes written on that ſubject in the 16th century. This writer maintains, that a council is ſuperior to the pope, and may depoſe him, not only for hereſy and ſchiſm, but for any notorious crime, perſiſted in after admonition; and that, in matters of faith, and ſuch as concern the ſtate of the church, or its head, the judgment of the council is to be preferred to that of the pope. He died in 1616. Dupin. Gen. Biog.

UGROCZ, in *Geography*, a town and caſtle of Hungary; 16 miles N. of Topoltzan.

UGUALE, Ital., in *Muſic*, equal; as, *à parti uguali*, two vocal or inſtrumental parts, of equal conſequence.

UHERCE, in *Geography*, a town of Auſtrian Poland, in Galicia; 64 miles S.W. of Lemberg.

UHLERSDORF, a town of Saxony, in the circle of Neuſtadt; 5 miles S.W. of Weyda.

UHLFELD, a town of Germany, in the principality of Bayreuth; 19 miles N.W. of Nuremberg.

UHRTSCHUTA, a town of Moravia, in the circle of Olmutz; 10 miles S.W. of Olmutz. N. lat. 49° 23′. E. long. 17°.

UI, a river of Ruſſia, which runs into the Irtiſch, near Malanova, in the government of Tobolſk.

Vi *et Armis*, q. d. *by force and arms*, a law-term uſed in an indictment; to denote the forcible and violent commiſſion of any crime.

Vi *Laica Removenda*, in *Law*, a writ lying where debate being between two parſons, or proviſors, for a church, one of them makes a forcible entry into it, with a number of laymen, and holds the other out.

VIA, *Way*. See Way, and Road.

Via *Lactea*, in *Aſtronomy*, the milky way, or *galaxy*; which ſee.

Via *Militaris*, in our *Law-Books*, is uſed for a highway. "Quæ publica dici poterit, et ducit ad mare, et ad portum, et quandoque ad mercata." Bracton, lib. iv. c. 16.

Via *Militaris*, in *Roman Hiſtory*. See Military *Ways*, and Way.

Via *Regia*, the *King's Highway*, is defined in Leg. Henry I. to be "that which is always open, and which nobody may ſhut by any means, as leading to a city, port, or town."

Its breadth the ſame laws preſcribe to be ſuch, as that two carts may paſs each other, and ſixteen horſemen armed may go abreaſt. See Highway.

VIA *Solis*, the *Sun's Way*, in *Astronomy*, is used, among some astronomers, for the ecliptic line; so called, because the sun never goes out of it.

VIA, *Turreta Chica*, in *Ancient Geography*, a place of Africa, in the eastern part of Mauritania Cæsariensis, situated on the sea-coast, some miles W. of Icosium, in which are the remains of some Roman walls and cisterns.

VIA, *Ulla*, a river of Hispania Citerior, which ran from the N.E. to the S.W., passed by Iria Flavia, and discharged itself into the sea.

VIA *Appia*. See APPIAN *Way*, and VIÆ *Romanæ*.

VIA *Domitiana*, took its name from Domitian, by whose orders it was executed. It detached itself from the Appian way at a small distance from Sinuessa, on the spot now called Mont-Dragone. This way opened under a triumphal arch, which was richly ornamented with marbles and metals, and passed along the sea by Vulturnum, Liternum, Cumæ, and Bayæ to Puteoli.

VIA *Curia*, a Roman way marked by Dionysius of Halicarnassus in the Sabine territory, on which were the following towns, *viz*. Cursula, 80 stadia from Reaté, and Issa near Cursalin. Some have represented this as the same with the Latin way.

VIA *Quintia*, which, according to Dion. Hal., belonged to the Sabines. Holstenius suggests that it was the same with the Via Salaria. Dion. Halic. places upon this way Palatium, 25 stadia from Reaté; Trebula, 60 stadia from Palatium; Vespola, 60 stadia from Trebula; Sima, 40 stadia from Vespola; Mephyle, 30 stadia from Suna; and Orvinium, 40 stadia from Mephyle.

VIÆ *Romanæ*, or *Roman Ways*, were public roads on which the ancient Romans impressed marks of grandeur and celebrity, as well as of utility, that have not been altogether effaced during an interval of more than 2000 years. In the construction of these roads they began with making a deep excavation, on each side of which they erected walls, and on these walls formed a parapet. The space between the walls was filled with layers of different materials, one of which was mortar made of the volcanic produce called puzzolano. Above these they placed the hardest stones which they could procure, and which they fastened together by an intermediate cement; and the saliant angles were so constructed as to form a large mass. The elevated parapet served not only to give solidity to the way, but to afford a convenient seat for those who travelled on foot; and at certain intervals they placed stones of a greater height, which served for the convenience of horsemen. On these ways they had temples and monuments, which contributed to their ornament; and the distances were marked on columns of stone. Originally they marked the distance of any place from a column in the city of Rome; but in process of time they noted the distance from the capital of the province, or from any other town which they selected for this purpose. The first of these Roman ways was the *Appian* way, which commenced at the gate of Rome bearing this denomination, and took a S.S.E. direction. To the right commenced the *Via Ardeatina*, which proceeded from the south as far as Ardea, almost perpendicularly to the meridian. Within the compass of Rome, at the foot of mount Cœlius, and to the left of the Appian way, commenced the *Via Latina*, the direction of which was to the S.E. At seven miles and a half commenced, to the left of the Latin way, the *Via Tusculana*. To the E. commenced the way, which, in the city, bore the name of *Via Sacra*. From this way, in the interior of the city, proceeded the *Via Campana* towards the S.E. The *Via Labicana* has an almost S.E. direction. Towards the E. is the *Via Prænestina*. To the left of this way, about the fifth mile from Rome, is the *Via Collatina*. Towards the N.E. the first way is the *Via Tiburtina*, passing, as its name indicates, to the Tiber. The second is the *Via Nomentana*, proceeding towards the N.E. to the tenth mile, and then turning directly northwards to Nomentum. The third is the *Via Salaria*, which is detached to the Colline gate from the left of the Nomentane way, and proceeding directly towards the N. as far as the eighth mile, rejoins the same way at Eretum. It is called Salaria, from the salt which the Romans used to bring to Rome along this way from the sea. It was through the gate Salaria that the Gauls entered Rome, under the command of their leader Brennus, when that city was first taken by them. Towards the N.W. the first way is the *Via Lata*, which formerly turning by the Capitoline mount, passed by the ancient triumphal gate. This way afterwards assumed the name of *Flaminia*. The second is the *Via Claudia*, which advanced towards the N.W.; and at the sixth mile proceeded the third way in this direction, or the *Via Cassia*, which proceeded to Veii. The fourth way is the *Via Triumphalis*, which at the ninth mile joined the Claudian way. The fifth bore the name of *Via Cornelia*, which proceeded by the W. ¼ N. to the tenth mile; and the sixth was the *Via Aurelia*, which left Rome at the gate of Janiculum, and proceeded a little towards the S.W., but changing its direction towards the N.W. it gained the sea-coast, along which it pursued its course.

Towards the S.W. the first way was the *Via Portuensis*, so called, as well as the gate by which it left the city, from their leading to the place called Portuensis, now called by corruption "Villa Portese." It passed by the S.E. and joined the route which followed the windings of the Tiber under the name of *Via Littoralis*, which last advanced to the "Portus Augusti." The second was the *Via Ustrensis*, which passed N.W. of the Circus Maximus, and crossing the Almo at the gates of Rome, it turned to the S.W. towards Ostia. The third way commenced five miles and a half on this way towards the left, under the name of *Via Laurentina*, which proceeded to the S. as far as Laurentum. We have above enumerated twenty-one ways or roads, which separating at the centre of Rome extended more or less to different parts of Italy. Bergier, to whom we are indebted for this detail on the Roman roads, proceeds, after having surveyed them at and near Rome, to trace their length and direction in various parts of Italy.

The military ways proceeding immediately from the gates of Rome, according to the table of Peutinger, and recorded in history, are eleven, agreeably to the following arrangement: *viz*. Via *Flaminia*, *Salaria*, *Numentana*, *Tiburtina*, *Prænestina*, *Lavicana*, *Latina*, *Appia*, *Hostiensis*, *Aurelia*, and *Triumphalis*.

The construction of the Flaminian road is ascribed by some authors to Flaminius, who was killed at the battle of the lake of Thrasymene, under the consulate of Lucius Veturius and Caius Lutatius, in the year of Rome 533; but Strabo ascribes this work to the son of this Flaminius, and he says expressly that he formed two grand roads in Italy, one from Rome to Ariminium (Rimini), called *Via Flaminia*; and another from Ariminium to Bononia (Bologna), and to Aquileia, which was denominated *Via Æmilia*. The distance from Rome to Rimini, according to the Itinerary of Antonine, was 222 Roman miles; but according to the table of Peutinger, 194 miles. History records nine military ways which parted from the *Via Flaminia*; and of all these ways, that called *Via Æmilia* was the most ancient, the most known, and the grandest of all; its length surpassed that of the Flaminian way, and

it was equally ancient. As to its antiquity, Strabo says that it was made at the same time with the Flaminian way, and Palladio ranks it among the three most renowned and most excellent, *viz. Via Appia, Via Flaminia,* and *Via Æmilia.* This latter extended from Ariminium to Bononia, and thence to Aquileia, a distance, according to Antonine's Itinerary, of 485 miles, and according to the table of Peutinger of 527 miles. The poet Martial, speaking of this famous way, and of one of the cities which he found upon it, (lib. iii. ep. 4.) says,

> "Romam vade, liber, si veneris undè requiret,
> Æmiliæ dicas de regione viæ,
> Siquibus in terris, qua simus in urbe rogabit,
> Corneli referas me licet esse fero."

The second branch of the Flaminian way is that called Cassian. It commenced at pons Milvius (or Ponte Mole), built upon the Tiber, two miles from Rome. From thence it took its direction by the town of Sutri.

The third branch, which detached itself from the Flaminian way, was the Claudian way, of which Ovid (l. i. de Ponto) says,

> "Nec quos pomiferis positos in collibus hortos
> Spectat Flaminiæ Claudia juncta viæ."

According to the Itinerary, the distance from Lucca to Rome was 239 miles, and according to the chart of Peutinger 145 miles.

Besides these, the Annienne, Augustan, Cimine, Amenienne, Sempronian, and Posthumian, commencing at different parts of the Flaminian way, extended themselves across the different regions of Italy, between the city of Rome and the Po. Of all these ways, that called the Annienne is known by an ancient inscription found in the ruins of the town of Axuma. The Cimine way was between a mountain and the lake of its name near Viterbo. Virgil thus speaks of it, (Æn. vii.)

> "Cimini cum monte Lucum, Lucosque Capenos."

The Amenienne way took its name from the town of Amelia, near Spoleto. The Sempronian way had its name from the town of Forum Sempronii, whence it extended as far as Fulginia or Fulcinium in Umbria. The Posthumian passed into Gaul, called by the Romans Togata; and Tacitus thus speaks of it: "Sistere tertiam legionem in ipso viæ Posthumiæ aggere tubet."

The *Via Salaria* commenced at the Colline gate, and extended towards the N. across the country of the Sabines, receiving the Nomentane way at the village of Hercelum, eighteen miles from Rome, on the bank of the Tiber. Its route, indicated by the Itinerary from Eretum to Hadria, was 166 miles, and according to Peutinger's table 168 miles. Near this way were built the temples of Ericina and Venus Verticordia, and also several magnificent tombs. From the *Via Salaria* branched out two other ways, *viz.* the Quinctian and the Junian.

The *Nomentane* way took its origin at the Viminal gate, and extended N.E. as far as Nomentum, a town of the Sabines, in ancient Latium. Ovid thus speaks of it, (Fast. l. iv.)

> "Hæc mihi Nomento Romam cum luce redirem
> Obstitit in media Caudida Turba via."

Two miles from the city, on the Nomentane way, was a temple of Bacchus, which afterwards became the tomb of the family of the Constantines. On this way were also several temples and sepulchres.

It has been said by some authors, that the Porta Tiburtina and the Porta Gabinia or Gabiosa were the same, and also the *Via Tiburtina* and *Via Gabinia* or *Gabiosa.* Others have maintained that they were different, issuing from the same gate; the Gabiana being more to the east than the Tiburtina; the former taking its course to the right, towards the Prænestine way, and the latter to the left, towards the N.E., passing by delightful places near the Tiber. From the Esquiline gate proceeded the two grand roads, called Prænestina and Lavicana. The Prænestine, according to Bergier, commenced at Rome, not far from the Forum; and at Anagnia, joined the *Via Latina.* The Lavicana also commenced in Rome; and having passed between two aqueducts, joined the Latin way at Anagnia. Strabo does not conduct the Lavicana so far; and the table of Peutinger terminates it at Lanuvium, twenty-nine miles from Anagnia. The *Via Latina* commenced at the gate of this name, and proceeded between the W. and the S. to join the grand Appian way, nineteen miles from Capua The Appian, Latin, and Valerian ways were the most considerable in Latium: the Valerian way, upon leaving Rome, proceeded towards the left, the Appian towards the right, and the Latin way between the two. We may here observe, that there were two ways under the name of Valerian, the ancient and the new. The Itinerary mentions one, and Strabo the other. The Latin way was called by the ancients the Ausonian way; accordingly Martial has given it these two names. On this way was found the temple of female Fortune, with her statue, which married women only were allowed to touch without committing sacrilege. Of the *Appian* way we have given a brief account under that article: and for a farther account of other ways, we refer to the preceding part of this article; our limits allowing of no farther enlargement. The Romans extended their ways through the whole extent of their empire, and it would fill a volume to trace them in Europe, Asia, and Africa. The Itinerary of Antonine, and the table of Peutinger, will afford the curious in this research great assistance. For an account of the Roman roads in Britain, see WAY.

In connection with the Roman roads, it may not be improper to enumerate, as briefly as possible, the gates of Rome. When Rome was founded, it comprehended only mount Palatine and the neighbouring valley, where was the Forum; and it had only three gates. When the Sabines were admitted by Romulus into a participation of the freedom of the city, it was enlarged, and the Capitol inclosed; and for admission on the side of the Capitol, a fourth gate was added. The first gate had the name of *porta Mutionis,* from the bellowings of the horned beasts which were sent through it to the adjoining pastures; the next called *Romula,* from the name of the city; and the third *Janualis,* from the god Janus, who inhabited this quarter. The fourth had the name of *porta Carmentalis,* from Carmenta, wife of Evander, who had his abode in that quarter, at the foot of the Capitol: which last gate is mentioned by Solinus, Plutarch (Life of Camillus), and Virgil (Æneid. viii.) In subsequent ages Rome was several times enlarged, and it became necessary to construct new gates; the four first serving merely for the fortress and the inclosure of the city. Numa, the successor of Romulus, added to the city a part of the Quirinal mount; and as the inhabitants multiplied, Tullus Hostilius joined to it mount Cœlius; Ancus Martius, the Janiculum; Servius Tullius, the rest of the Quirinal and the Viminalis. A long time afterwards, Sylla, Julius Cæsar, Augustus, and Tiberius, enlarged the compass of the city, so as to include a variety of magnificent edifices.

edifices. Nero having set fire to it, added to its former grandeur; Trajan also augmented it, as did also Aurelian, who inclosed the Campus Martius; and, finally, Constantine the Great enlarged it on the side of the Viminal and Tiburtine gates. Authors have differed as to the number of gates which belonged to the city of Rome. Pliny, in his time, reckoned twenty-four; but Procopius states them at fourteen, besides those less considerable gates, which he calls portulæ. In order to reconcile these discordant statements, it has been said that Rome had fourteen royal and principal gates, which might be denominated imperial and military, and to which all the military ways of Italy were directed; and besides these it had, in Pliny's time, ten others of inferior importance. The first fourteen, with their ancient and modern names, were the following, *viz. P. Flamentana*, afterward *Flaminia*, now the gate of the people, or del Popolo, from a church built near it by pope Pascal II., dedicated to the Virgin Mary, under the appellation of Sta. Maria del Popolo:—*Collatina*, so called because it led to a town of that name in the country of the Sabines, not far from Rome, since *Pinciana*:—*Agonensis*, bearing that name from the Agonalia celebrated just without it; since *Quirinalis*, from a chapel sacred to Romulus (Quirinus), which stood near it; also *Collatina*, or *Collina*, from its situation at the junction of the hills Quirinalis and Viminalis; and last of all, *Salaria*:—*Viminalis*, so called on account of the osiers that grew near it, and because it was situated on the declivity of mount Viminalis; called also *Nomentana*, or *Numentana*, because the road through it led to Numentum; and now the gate of St. Agatha, or St. Agnes:—*Gabiosa*, so named from its leading to a road called Gabina; called by St. Gregory *Metroni*:—*Esquilina*, originally so called from its situation on mount Esquiline; *Taurina*, from the head of an ox engraved upon it; *Tiburtina*, from its leading to Tibur, now Tivoli; *Libitensis*, on account of the dead bodies that used to be carried through it to be interred in the Campus Esquilinus, the burying place of the common people; *Labicana* and *Prænestina*, because the roads passing through it led to these places; now, as some say, the gate of *St. Laurence*, to whose magnificent church it leads; but others ascribe the name of St. Laurence to the *Gabiosa*, and say this is the Porta major or greater gate; hence it is said that this name, as well as that of *Sancti Crucis*, or of the *Holy Cross*, is applied to *P. Nævia*, so called, says Varro, from the *nemoribus* or woods that formerly stood near it, or from an adjacent wood belonging to one Nævius; and it is observed that the Claudian aqueduct runs close by it:—*Cœlimontana*, so denominated from its situation on mount Cœlius; since *Asinaria*, so called either from a road of that name to which it led, or from gardens, called the Asinarian, situated near it, or from Asinius Pollio or Asinius Gallus, consuls under Augustus, who built or repaired it; its oldest name was *Querquetulana*, under which name it is mentioned by Cicero; now *St. John's* gate, because it leads to St. John Lateran:—*Ferentina*, a name derived from Ferentinum, a place on the Latin way; since *Latina*, from its leading to Latium, now the Campagna di Roma; near it is now a chapel dedicated to *St. John* the *apostle*, from whom the gate is at present called:—*Capena*, so called from Capua, an old city of Italy, the way to which led through this gate; since *Appiana*, from its leading to the Appian way; or *Triumphalis*, from some triumphs in which the procession passed through it; it was also, as some say, called *Fontinalis*, from the aqueducts which were raised over it; now the gate of *St. Sebastian*, from a church dedicated to that saint, which stands near it:—*Trigemina*, anciently so named from the three Horatii, who went out at this gate to fight the Curiatii; called also *Appia*, from its being near the Appian aqueduct; *Fontinalis*, from its being near a number of springs; and *Ostiensis*, on account of the road to Ostium, which began there; now the gate of *St. Paul*, from a noble church dedicated to that apostle, to which it leads, without the walls:—*Navalis*, so called from its being near the river; and *Portuensis*, from its leading to the city of this name:—*Janiculensis*, named probably from a bridge of that name which led to this gate; sometimes called *Trajana*, as having been repaired by the emperor Trajan; and *Aureliana*, from the emperor Aurelian, who either built or repaired it; now *St. Pancras's* gate:—*Fontinalis*, called also *Septimiana*, from the emperor Septimius Severus, who built it, and whose baths are just without this gate; it was repaired by pope Alexander VI.:—and *Aurelia*, near the gate of Adrian. The other ten gates were of less importance; they were called *Portulæ* by Procopius, but there is a confusion in their names, which are as follow, compared with those of the other class: *viz. Querquetula*, or *Querquetulana*, on mount Viminal:—*Piacularis*:—*Catularia*:—*Minutia*:—*Mugiona*:—*Sanqualis*:—*Nævia*:—*Raudusscula*, or *Rawdusculana*:—*Lavernalis*:—and *Libitensis*. Besides these twenty-four gates, there is yet one which served for an entrance into the city of Rome, on the side of mount Vatican, and on this side of the Tiber, not comprehended under those which we have already recounted. It is the most celebrated of all, and bore the name of *P. triumphalis*, ascribed by some to *Capena*, already mentioned.

Via, in *Geography*, a town of Persia, in the province of Segestan; 15 miles S.E. of Ferah.

Via *Reggia*, a sea-port town of the state of Lucca, and the only port of the republic; 20 miles W. of Lucca.

VIACHA, a town of Peru, in the diocese of La Paz; 8 miles S.W. of La Paz.

VIACIENSES, or Viatienses, in *Ancient Geography*, a people of Hispania Citerior, comprehended under the general name of Oretani.

VIADANA, Lodovico, in *Biography*, the inventor of the expedient of expressing chords by figures in accompaniment or thorough-base, which the Italians call *basso continuo*, was born at Lodi, in the Milanese, the latter end of the sixteenth century. His first preferment was that of maestro di cappella of the cathedral of Fano, and the second that of Mantua. He was one of the most distinguished ecclesiastical composers of his time. The indication of chords by figures in accompanying on keyed instruments, lutes, harps, and, in recitatives, even violoncellos, has been doubted, as several instances of the minute beginnings of this expedient have been observed previous to the time of Viadana; but he was, doubtless, the first who drew up general rules for expressing harmony by figures over the base in 1615. Draudius, in an ample list of his ecclesiastical compositions, which were very numerous, tells us of one that authenticates his claim to this invention, which was a collection of all his choral pieces, of one, two, three, and four parts; "with a continued and general base, adapted to the organ according to a new invention, and useful for every finger as well as organist; to which are added short rules and explanations for accompanying a general base, according to the new method." Vidana was therefore the first who composed an organ base different from the voice-part, in the execution of which the new invented figures enabled the performer to give the fingers the whole harmony of the several parts of a full composition, without seeing the score.

As the construction of perpetual fugue, or canon, required more meditation and science than any other species of

of composition, there were several musicians during the seventeenth century, who, from an ambition to excel in such difficult undertakings, seem to have devoted as great a portion of their lives to these labours as holy men ever did to severe acts of piety and devotion, in order to be canonized.

Though the learned and elaborate style in which both the music of the church and chamber continued to be cultivated at this period, till near the middle of the seventeenth century; yet a revolution in favour of melody and expression was preparing, even in sacred music, by the success of dramatic composition, consisting of recitation and melodies for a single voice, which now began to be preferred to music of many parts, in which canons, fugues, and full harmony, were the productions which chiefly employed the master's study and hearer's attention. And this rendered the art of accompaniment or thorough-base more necessary. See CHORDS, ACCOMPANIMENT, and THOROUGH-*Base*.

VIADANA, in *Geography*, a town of Italy, in the department of the Mincio, on the Po; 23 miles S.S.W. of Mantua.

VIADUS, or VIADRUS, in *Ancient Geography*, a river of Germany, which had its source in Suevia, and discharged itself into the Suevian sea, or Codanus Sinus. This river is called *Guttallus* by Pliny.

VIÆ PRIMÆ, the first passages; a technical term for the stomach and intestines.

In this sense we say, an obstruction in the primæ viæ. Purging and emetic medicines operate chiefly on the primæ viæ. And sudorifics, alteratives, cardiacs, &c. suspend their action till after they have passed the primæ viæ.

VIAL, or PHIAL, a small and thin glass bottle. See PHIAL.

VIALA *du Tarn, Le*, in *Geography*, a town of France, in the department of the Aveiron, near the Tarn; 9 miles S.W. of Milhaud.

VIALES, in *Mythology*, a name given, among the Romans, to the gods who had the care and guard of the roads and highways. Such were Mercury and Hercules.

The Dii Viales, according to Labeo, were of the number of those gods called Dii Animales; who were supposed to be the souls of men, changed into gods: these were of two kinds; *viz.* the Viales and Penates.

The Viales were the same with those otherwise called Lares; at least, some of the Lares were denominated Viales; *viz.* such of them as had the more immediate superintendency of the roads.

Hence the two names are sometimes joined, and those highway-deities are called Lares Viales; witness that inscription in Gruter:

FORTUNAE
REDUCI LARI
VIALI ROMAE
AETERNAE
Q. AXIUS AELIA
NUS—VE. PROC.
AUG.

IONI.

VIAMON, in *Geography*, a town of Brasil, in the jurisdiction of Rio de Janeiro.

VIANA, in *Ancient Geography*, the name of a town of Norica. Pliny.

VIANA, in *Geography*, a mountain of Portugal, in the province of Alentejo; 3 miles S. of Evora.—Also, a town of Portugal, in the province of Alentejo; 12 miles S. of Evora.—Also, a town of Spain, in Galicia; 30 miles E.S.E. of Orense.—Also, a town of Spain, in Navarre, on the Ebro; 16 miles S.W. of Estella.

VIANA *de Foz de Lima*, a sea-port of Portugal, in the province of Entre Ducro e Minho, situated on the N. side of the Lima, near its mouth, containing two parishes, an hospital, seven convents, and about 7000 inhabitants; the harbour is choaked up, and only capable of receiving small vessels; 9 miles W.S.W. of Ponte de Lima. N. lat. 41° 41′. W. long. 8° 26′.

VIANDEN, or WYANDEN, a town of France, in the department of the Forests, late the duchy of Luxemburg, called by the Germans Vyenthal, situated on the river Uren, which divides it into New and Old Town, in the midst of rocks and mountains. In the Old Town is a castle, situated on a rock of prodigious height, where a garrison was kept. Vianden is a very ancient and illustrious comté, which comprehends forty villages and hamlets, that belonged to the house of Nassau. The inhabitants carry on a considerable trade in manufacturing cloth and the tanning of leather; 18 miles N.N.E. of Luxemburg.

UJANDINSKOE YASASCHNOE, a town of Russia, in the government of Irkutsk, on the Indigirda; 148 miles N.N.E. of Zashiversk. N. lat. 68° 40′. E. long. 132° 14′.

VIANEN, or VYANEN, a town of Holland, situated on the S. side of the Leck; 7 miles S. of Utretch.

VIANINA, a town of the duchy of Piacenza; 20 miles S. of Piacenza.

VIANO, a town of the duchy of Piacenza; 13 miles S. of Piacenza.

VIANOS, a town of Spain, in New Castile; 3 miles S. of Alcaraz.

VIAREDEN, a town of Brandenburg, in the Ucker Mark; 1 mile N. of Schwedt.

VIAS, a town of France, in the department of the Herault; 6 miles N.W. of Agde.

VIASDUM, a town of Poland, in the palatinate of Rawa; 16 miles W. of Rawa.

VIAST. See VIEST.

VIATICUM, among the ancient Romans, was the allowance or appointment which the republic gave to such of its officers as were sent into the provinces to exercise any office, or to perform any service or commission; as also to the officers of the army, and even the soldiers, &c.

Tacitus makes mention of it, Annal. lib. i. c. 37. *Viaticum amicorum, ipsiusque Cæsaris;* meaning the appointments which the republic paid to Germanicus and his officers.

This viaticum, however, did not consist altogether in money: the ring given to the magistrates and officers sent into the provinces was part of it; so were the clothes, baggage, tents, and the rest of the equipage.

Some have also given the name of viaticum to the piece of gold, silver, or copper, which the ancients used to put into the mouths of the dead, to pay Charon for their passage.

In the Romish church, viaticum is still the allowance made a religious, to defray the expences of a journey, mission, &c.

VIATICUM is also used for the communion, or eucharist, which is given to the people in the pangs of death, or who are about to make the voyage of the other world.

The viaticum is not to be given to persons executed in course of justice.

VIATKA, in *Geography*, a town of Russia, and capital of the government of Viatskoe: the environs of this city abound in excellent pasture for sheep, of which great numbers were sent hither from Germany, and a woollen manu-

manufacture was established by the great Peter. Some tanners likewise were brought by him from England, to teach the art of tanning leather; 624 miles E. of Petersburg. N. lat. 58° 25′. E. long. 50° 22′.—Also, a river of Russia, which passes by Viatka, Orlov, Kotelnitch, &c. and runs into the Kama, 40 miles E. of Kazan.

VIATOR, in *Antiquity*, an officer of justice among the Romans. The term, originally, had no other signification than that of a public messenger, or servant, sent to advertise the senators and magistrates when assemblies were to be held, where their presence was required.

Hence, because, in the first ages of that empire, the Roman magistrates lived mostly at their country houses; these officers being obliged to be frequently upon the road, were called *viatores, travellers;* from *via, highway*.

In process of time, the name *viator* became common to all officers of the magistrates, lictors, accensi, scribes, statores, and criers; either by reason these names and offices were confounded in one; or because *viator* was a general name, and the rest particular ones, specifying the particular functions they discharged, as A. Gellius seems to insinuate, when he says, that the member of the company of viatores who binds a criminal condemned to be whipped, was called *lictor*.

Be this as it will, the names *lictor* and *viator* are often used indiscriminately for each other; and we as often meet with *Send to seek*, or *advertise him by a lictor*, as *by a viator*.

None but the consuls, prætors, tribunes, and ædiles, had a right to have viatores. They were not to be Roman citizens, and yet they were required to be free.

VIATORE, in *Geography*, a town of Hindoostan, in the country of the Nayrs; 25 miles N.E. of Tellichery.

VIATSKOE, a government of Russia, bounded on the N. by the government of Vologda, on the E. by Permskoe. on the S. by Uphinskoe and Kazanskoe, and on the W. by Kostromskoe; 260 miles long, and from 80 to 180 broad, N. lat. 55° 40′ to 60° 25′. E. long. 46° to 54°.

VIAZMA, a town of Russia, in the government of Smolensk. This town is situated on an eminence, and covers a great extent of ground; it is irregularly built, chiefly of wooden houses, a few only of the more modern being of brick. It contains more than twenty churches, a great number for the town, which is far from being populous; 76 miles E.N.E. of Smolensk. N. lat. 55° 20′. E. long. 24° 26′.

VIAZNIKI, a town of Russia, in the government of Vladimir, on the Kliazma; 52 miles E. of Vladimir. N. lat. 56° 10′. E. long. 41° 50′.

VIAZOVSKOI, a town of Russia, in the government of Upha, on the Ural; 36 miles E.S.E. of Orenburg.

VIBANTANARIUM, or VIBANTAVARIUM, in *Ancient Geography*, a town of European Sarmatia. Strabo and Ptolemy.

VIBELLI, a people of Italy, in Liguria. Pliny.

VIBEX is sometimes used, by *Physicians*, for a black and blue spot on the skin, occasioned by an afflux or extravasation of blood.

VIBI FORUM, in *Ancient Geography*, a place of Italy, in Gallia Cisalpina.

VIBINUM, a place of Italy, in Apulia, making a part of Magna Græcia.

VIBISCUS, a town of Gallia Celtica, or the Lyonnese, among the Helvetians. Anton. Itin.

VIBO, VIBONA, or *Vinoba*, a town of Italy, in Brutium, upon the route from Rome to Colonne, by the Appian way, between Ad Turres and Nicotera. Cicero calls it Vibo.

VIBORG, or WIBORG, in *Geography*, a city of Denmark, capital of a diocese, and all North Jutland, situated near the centre of the province, on a lake, called Asmild, which abounds in fish. It is one of the most ancient towns of the kingdom, and was formerly large and rich, containing, prior to the reformation, twelve churches and six convents. At present it is about two miles in circumference, and contains three parish churches. It is still the residence of a governor, and the see of a bishop; and a provincial court is held here every month for all North Jutland. In 1528, the reformation first began in this town; 186 miles N. of Hamburgh. N. lat. 36° 32′. E. long. 9° 18′.

VIBORG, or *Wyborg*, a sea-port town of Russia, and capital of a government, to which it gives name, in the gulf of Finland; the see of a bishop. This town was built in the year 1293, and was heretofore the capital of Carelia. It was founded by Birger Jahl as a military hold, that should enable him to check the increasing power of the republic of Novgorod, so famous in those days. Peter the Great having taken this town by capitulation in the year 1710, improved its fortifications, which have ever since been kept in tolerable good condition, so that Viborg was looked on as the bulwark of Russia against Sweden. They are now, however, in a somewhat dilapidated state, and not regarded as of much use. The principal exports are planks, tallow, pitch, and tar, for which the English are the greatest customers: their imports are mostly purchased from France and Holland, and are chiefly wine, spices, and salt; 360 miles S.W. of Archangel. N. lat. 60° 50′. E. long. 28° 50′.

VIBORGIA, in *Botany*, erroneously written *Wiborgia*, received its name in honour of Mr. Eric Viborg, a learned and acute Danish botanist, author of several botanical and economical treatises in his own language, published eighteen or twenty years ago at Copenhagen.—Thunb. Prodr. n. 45. Willd. Sp. Pl. v. 3. 919.—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Eff. Ch. Stamens all connected. Calyx five-toothed, with rounded interstices. Legume turgid, furrowed, winged.

1. V. *obcordata*. Thunb. Prodr. 121. Willd. n. 1.—Leaflets smooth, obtuse. Branches elongated, lax.—A shrub, found at the Cape of Good Hope.

2. V. *fusca*. Thunb. ibid. Willd. n. 2.—Leaflets smooth, pointed. Branches wand-like, erect.—A shrub, from the same country.

3. V. *sericea*. Thunb. ibid. Willd. n. 3.—Leaves downy, as well as the wand-like branches.—This is also a Cape shrub. We have seen none of the species. The genus seems well defined, though we lament the meagreness of its history.

VIBORSKOI, in *Geography*, a government of Russia, of which Viborg is the capital; bounded on the N. and W. by Finland, on the S. by the gulf of Finland and the government of Petersburg, and on the E. by lake Ladoga and the government of Olonetz; its form is very irregular. Its extent from N. to S. about 152 miles, where longest, in other places scarcely 60; its breadth from 60 to 100. N. lat. 60° 15′ to 62° 40′. E. long. 26° to 32°.

VIBRAIS, or VIBRAYE, a town of France, in the department of the Sarte; 9 miles N. of St. Calais.

VIBRANT, or VIBRION, in *Natural History*, the name of a class of flies, commonly known by the name of the *ichneumons*.

The word is derived from the Latin *vibro, to shake* or *quiver*, and is applied to these flies, from the continual vibrating motion observed in their antennæ.

VIBRATION, in *Mechanics*, a regular, reciprocal motion

tion of a body, *e. g.* a pendulum; which, being suspended at freedom, swings, or vibrates, first this way, then that. For the bob being raised, falls again by its gravity; and with the velocity thus acquired, rises to the same height on the other side; whence its gravity makes it fall again: and thus its vibrations are continued.

Mechanical authors, in lieu of vibration, frequently use the term *oscillation;* which see.

The vibrations of the same pendulum are all isochronal; that is, they are performed in equal time, at least in the same climate: for, towards the equator, they are found somewhat slower. See PENDULUM.

A pendulum 3 feet $3\frac{2}{10}$ inches, according to Huygens, or 39.25 inches, according to sir J. Moor and lord Brouncker, vibrates seconds, or makes 3600 vibrations in an hour.

The vibrations of a longer pendulum take up more time than those of a shorter one, in a subduple ratio of the lengths. Thus, a pendulum three feet long will make ten vibrations, while another nine inches long makes twenty. For 10 is the half of 20, and 3 feet, or 36 inches, are the square of 6 inches; which is double of 3, whose square is 9; so that 10 is to 20 in a subduple ratio of 36 to 9.

The same thing is meant when we say, that the number of vibrations of pendulums, in a given time, is in a reciprocal subduple ratio of their lengths.

The following table shews the number of vibrations in a minute, corresponding to pendulums of different lengths, expressed in inches.

Length.	Vibrations.	Length.	Vibrations.	Length.	Vibrations.
4	187	10	118	35	63
5	167	12	107	40	59
6	153	15	97	50	53
7	142	20	84	60	47
8	132	25	75		
9	125	30	68		

M. Mouton, a priest of Lyons, wrote an express treatise to shew, that, by means of the number of vibrations of a given pendulum, in a certain time, one might establish an universal measure throughout the whole world; and fix the several measures in use among us, in such manner, as that they might be recovered again, if at any time they should chance to be lost, as is the case of most of the ancient measures; which we now only know by conjecture. See *Universal* MEASURE and STANDARD.

The vibrations of a *stretched chord*, or *string*, arise from its elasticity; which power being of the same kind with that of gravity, the vibrations of a chord follow the same laws as those of pendulums: consequently, the vibrations of the same chord equally stretched, though they be unequal in length, are equidiurnal, or are performed in equal times: and the squares of the times of the vibrations are among themselves, inversely, as the powers by which they are equally bent and inflected. (See CHORD and STRING.) On this subject, see Young's Philos. vol. ii. p. 546.

The sounding body in action quits its tranquil state by slight, but sensible and frequent undulations, each of which is called a *vibration*. These vibrations, communicated to the air, convey to the ear, by that vehicle, the sensation of sound; and this sound is grave or acute, in proportion as the vibrations are more or less frequent in the same time. See SOUND.

The vibrations of a *string* (which see), too, are proportionable to the powers by which it is bent: these follow the same laws as those of the chord, or pendulum; and, consequently, are equidiurnal; which is the foundation of spring watches.

For Pythagoras's account of the doctrine of vibrations, see PYTHAGORAS.

VIBRATIONS are also used in *Physics*, &c. for divers other regular alternate motions. Sensation is supposed to be performed by means of the vibratory motion of the contents of the nerves, begun by external objects, and propagated to the brain.

This doctrine has been particularly illustrated by Dr. Hartley, and extended farther by him than by any other writer, in establishing a new theory of our mental operations. The doctrine of vibrations, and its use in explaining our sensations, are comprised by this writer in the following propositions: that the whole medullary substance of the brain, spinal marrow, and the nerves proceeding from them, is the immediate instrument of sensation and motion: that this white medullary substance of the brain is also the immediate instrument by which ideas are presented to the mind; or, in other words, whatever changes are made in this substance, corresponding changes are made in our ideas, and *vice versâ:* that the sensations remain in the mind for a short time after the sensible objects are removed: that external objects impressed upon the senses occasion, first in the nerves on which they are impressed, and then in the brain, vibrations of the small, and, as one may say, infinitesimal, medullary particles: that these vibrations are excited, propagated, and kept up, partly by the ether, *i. e.* by a very subtile and elastic fluid, and partly by the uniformity, continuity, softness, and active powers of the medullary substance of the brain, spinal marrow, and nerves; which Dr. Hartley supposes are rather solid capillaments, according to sir Isaac Newton, than small tubuli, according to Boerhaave: and that the phenomena of sensible pleasure and pain, and also those of sleep, appear to be very suitable to the doctrine of vibrations. Hence he proceeds to establish the agreement of the doctrine of vibrations with the phenomena of ideas. Sensations, he says, by being often repeated, leave certain vestiges, types, or images of themselves, which may be called simple ideas of sensation; because the most vivid of these ideas are those where the corresponding sensations are most vigorously impressed, or most frequently renewed; whereas, if the sensation be faint or uncommon, the generated idea is also faint in proportion, and, in extreme cases, evanescent and imperceptible. The exact observance of the order of place in visible ideas, and of the order of time in audible ones, may likewise serve to shew, that these ideas are copies and offsprings of the impressions made on the eye and ear, in which the same orders were observed respectively: and though it happens that trains of visible and audible ideas are presented in sallies of the fancy, and in dreams, in which the order of time and place is different from that of any former impressions; yet the small component parts of these trains are copies of former impressions; and reasons may be given of the varieties of their compositions. Sensory vibrations, by being often repeated, beget, in the medullary substance of the brain, a disposition to diminutive vibrations, which may be also called *vibratiuncles* and miniatures corresponding to themselves respectively: so that if it be allowed that original impressed vibratory motions leave a tendency to miniature ones of the same kind, place, and line of direction, this author infers, that sensations must beget ideas, not only in the senses of sight and hearing, where the ideas are sufficiently vivid and distinct, but in the three others, since their sensations are also conveyed to the mind by means of vibratory motions.

Any sensations, says Dr. Hartley, by being associated with one

one another a sufficient number of times, get such a power over the corresponding ideas, that any one of the sensations, when impressed alone, shall be able to excite in the mind the ideas of the rest: and any vibrations, by being associated together a sufficient number of times, get such a power over the corresponding miniature vibrations, that any of those vibrations, when impressed alone, shall be able to excite the miniature of the rest. Hence he argues, that simple ideas will run into complex ones, by means of association, and that when this is the case, we are to suppose, that the miniature vibrations corresponding to those simple ideas run, in like manner, into a complex miniature vibration, corresponding to the resulting complex idea; some of which complex vibrations, attending upon complex ideas, may be as vivid as any of the sensory vibrations excited by the direct action of objects. See ASSOCIATION and *Mental* PHILOSOPHY.

Dr. Hartley also applies the doctrine of vibrations to the explication of muscular motion, which, he thinks, is performed in the same general manner as sensation, and the perception of ideas. For a particular account of his theory, and the manner in which it is largely illustrated, and the arguments by which it is supported, we must refer to his Observations on Man, vol. i. passim.

The several sorts and rays of light sir Isaac Newton conceives to make vibrations in the ether of several magnitudes or velocities; which, according to those magnitudes or velocities, excite sensations of several colours; much after the same manner as vibrations of air, according to their several magnitudes or velocities, excite sensations of several sounds. See COLOUR and SOUND.

Heat, according to the same author, is only an accident of light, occasioned by the rays putting a fine, a subtile, ethereal medium, which pervades all bodies, into a vibrative motion, which gives us that sensation. See ÆTHER and HEAT.

From the vibrations or pulses of the same medium, he accounts for the alternate fits of easy reflection and easy transmission of the rays. See REFLECTION and UNDULATION. See also LIGHT.

In the Philosophical Transactions, it is observed that the butterfly, into which the silk-worm is transformed, makes one hundred and thirty vibrations, or motions of its wings, in one coition.

VIBRATIUNCLES. See VIBRATIONS, *supra*.

VIBRATO, in *Geography*, a river of Naples, which runs into the Adriatic, 2 miles N.N.E. of Giulia Nova.

VIBRISSÆ, a word used by medical writers to express the hairs in the nostrils.

VIBURNUM, in *Botany*, reckoned by Linnæus, *Phil. Bot.* 174, among the Latin names whose origin cannot be ascertained, is traced by Vaillant, Ainsworth, and Martyn to the verb *vieo*, to bind; which is perfectly consistent with Virgil's expression of *lenta viburna*, but does not decide the old doubt, whether the poet meant our *Viburnum*, or any shrub of the willow or osier kind. Matthiolus has led modern botanists to apply this name to the genus before us, one of whose species, *V. Lantana*, he conceives to be Virgil's plant, on account of its great pliability and humble flexible growth, well contrasted with the tall and upright cypress.—Linn. Gen. 147. Schreb. 197. Willd. Sp. Pl. v. 1. 1486. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 334. Prodr. Fl. Græc. Sibth. v. 1. 206. Ait. Hort. Kew. v. 2. 166. Pursh 201. Juss. 213. Tourn. t. 377. Lamarck Illustr. t. 211. Gærtn. t. 27. (Opulus; Tourn. t. 376. Tinus; Tourn. t. 377.)—Class and order, *Pentandria Trigynia*. Nat. Ord. *Dumosæ*, Linn. *Caprifolia*, Juss.

Gen. Ch. *Cal.* Perianth superior, very small, in five deep permanent segments. *Cor.* of one petal, bell-shaped, cut half way down into five obtuse, reflexed or spreading segments. *Stam.* Filaments five, awl-shaped, the length of the corolla; anthers roundish. *Pist.* Germen inferior, roundish, crowned with a turbinate gland; styles scarcely any; stigmas three. *Peric.* Berry roundish, of one cell. *Seed* solitary, roundish, bony.

Eff. Ch. Calyx superior, deeply five-cleft. Corolla in five segments. Berry with a solitary seed.

Viburnum is technically distinguished from SAMBUCUS, (see that article,) by having one *seed* instead of three. The *stem* is shrubby, scarcely arborescent, with tough and pliant branches. *Leaves* simple, opposite, stalked, mostly elliptical, undivided, except in the *Opulus* of Tournefort and its nearest allies. *Flowers* generally terminal, cymose, copious, whitish. *Berry* red, blue, or black; in some cases eatable. The plants are hardy, natives of Europe, America, or Japan.

1. V. *Tinus*. Common Laurus-Tinus. Linn. Sp. Pl. 383. Willd. n. 1. Ait. n. 1. Curt. Mag. t. 38. (Tinus, n. 1, 2, and 3; Clus. Hist. v. 1. 49. Laurus Tinus; Ger. Em. 1409.)—Leaves ovate, entire; their veins furnished with axillary tufts of hair underneath. Cymes smooth.—Native of Spain, Portugal, and Italy, especially about the coasts of the Mediterranean. In our gardens it is a valuable evergreen, thriving best near the sea, seldom injured, except by very hard and lasting frosts, which sometimes destroy it nearly to the root. In a pure air it flowers all winter long, even when partially covered with snow; but in close or smoky situations, the plant is easily killed, and never blossoms. The berries are seldom perfected but in a greenhouse. At Vienna this shrub, like the *Prunus Lauro-cerasus*, is always treated as a greenhouse plant. We have lately seen what is now become the English name, affectedly accented *Laurústinus*. But it is a compound word, meaning *Laurus*, which is called *Tinus*; and Ovid teaches us that the first syllable of TINUS is long; see that article. The species before us is very bushy, spreading widely, seldom above five feet high; the twigs smooth, dark red; angular when young. *Leaves* two or three inches long, acute, veiny; dark shining green above; paler beneath, with glandular hairs at the origin of each large vein. *Flowers* tinged with red. *Berries* blue, like burnt steel, very beautiful. The *leaves* are occasionally more or less hairy, whence Clusius and Aiton distinguish three or four varieties.

2. V. *tinoides*. Mexican Laurus-Tinus. Linn. Suppl. 184. Willd. n. 2.—Leaves elliptical, entire; the origin of their veins slightly hairy underneath. Cymes and young branches hairy.—Sent by Mutis from Mexico. Like the preceding, but the *leaves* have shorter *footstalks*, and are elliptical rather than ovate; the young *branches*, and all the *flower-stalks*, are clothed with bristly hairs.

3. V. *villosum*. Downy Jamaica Viburnum. Swartz Ind. Occ. 564. Willd. n. 3.—Leaves ovate, acute, entire; hoary and downy beneath.—Gathered by Masson and Swartz on hills in the southern part of Jamaica, flowering in autumn. A *shrub* about six or eight feet high, with a grey bark. The young *branches*, like the *footstalks*, *cymes*, and backs of the *leaves*, are clothed with soft, starry, hoary pubescence, particles of which are also scattered over the green upper surface of each leaf. *Flowers* white.

4. V. *scandens*. Climbing Viburnum. Linn. Suppl. 184. Willd. n. 4. (V. virens; Thunb. Jap. 123.)—Stem twining. Leaves lanceolate, serrated. Cymes lax. Styles twice as long as the calyx. Outer flowers radiant.—Native of Japan. A slender climbing *shrub*, with short, leafy, opposite *branches*. *Leaves* two inches long, thin, tapering at each

each end, bright green, ſmooth. *Cymes* ſlender, hairy, of three unequal branches. *Flowers* white; a few of them imperfect, with large, dilated, unequal, radiant *calyx-leaves* inſtead of *petals*, as in the Guelder-roſe, &c. Thunberg deſcribes ten *ſtamens*, but this is an accident, or error, his own ſpecimen before us having but five. The three elongated *ſtyles*, with club-ſhaped *ſtigmas*, are remarkable. Nothing is known reſpecting the *fruit*. The *germen* is turbinate, encircled with the *calyx*, as in *Hydrangea*.

5. V. *nudum*. Smooth Oval-leaved Viburnum. Linn. Sp. Pl. 383. Willd. n. 5. Ait. n. 2. Purſh n. 4. (V. foliis ovato-lanceolatis integerrimis; ſubtus venoſis; Mill. Ic. 183. t. 274.)—Leaves elliptical, bluntiſh, ſomewhat revolute, nearly entire, very ſmooth, as well as the cymes, branches, and footſtalks.—Native of North America, in ſwamps, particularly on a ſandy ſoil, from Canada to Georgia, flowering in May and June. Every part is very ſmooth. *Leaves* three or four inches long; evergreen in the ſouthern ſtates of North America, but not in our gardens. The *cymes* are large, on long terminal *ſtalks*. *Flowers* copious, white. *Berries* black.

6. V. *obovatum*. Smooth Obovate Viburnum. Walt. Carol. 116. Poiret in Lam. Dict. v. 8. 658. Purſh n. 5.—Leaves obovate, obtuſe, ſmooth, entire or ſomewhat notched. Cymes ſeſſile. Berries roundiſh-ovate.—In ſhady woods of Carolina and Georgia, flowering in May and June. *Purſh*. *Flowers* white, ſmall. *Berries* blackiſh. This is ſuppoſed to be *V. caſſinoides* of Michaux, *Boreal.-Amer.* v. 1. 179, though not that of Linnæus.

7. V. *prunifolium*. Plum-leaved Viburnum. Linn. Sp. Pl. 383. Willd. n. 6. Ait. n. 3. Purſh n. 1. (V. Lentago; Moench Hort. Weiſſenſt. 140. t. 8. Meſpilus prunifolia virginiana; Pluk. Phyt. t. 46. f. 2.)—Smooth, with wide-ſpreading branches. Leaves roundiſh-obovate, finely ſerrated. Footſtalks even. Cymes ſeſſile. Berries roundiſh.—Common in hedges and fields, from New England to Carolina, flowering in May and June. A hardy ſhrub, cultivated by Miller. The *leaves* are ſcarcely an inch and a half long, full an inch broad, minutely and ſharply ſerrated. *Flowers* white. *Berries* dark blue.

8. V. *pyrifolium*. Sharp-leaved Viburnum. Poiret in Lam. Dict. v. 8. 653. Purſh n. 2.)—Smooth. Leaves ovate, pointed, ſerrated. Cymes ſomewhat ſtalked. Berries elliptic-oblong.—On the banks of rivers, in Pennſylvania, New Jerſey, &c. flowering in May and June. Reſembles the former, but is not ſo ſtraggling in its growth. *Berries* black. *Purſh*. Our wild Pennſylvanian ſpecimen has copiouſly ſerrated *leaves*, two inches and a half long, with taper entire points. The *fruit* ſeems rather obovate. This may perhaps be *V. arboreum*, Muhlenb. Catal. 32. n. 12, our ſpecimen having been ſent by that excellent botaniſt, without a name, and formerly referred by us to *prunifolium*, to which it is certainly near akin.

9. V. *dauricum*. Siberian Viburnum. Pallas Roſſ. v. 1. p. 2. 30. Willd. n. 7. Ait. n. 4. (Lonicera mongolica; Pall. Roſſ. v. 1. p. 1. 59. L. daurica; ibid. t. 38. L. n. 8; Gmel. Sib. v. 3. 135. t. 25.)—Leaves ovate, ſerrated, dotted and hairy. Cymes of few flowers.—Found in the fiſſures of rocks, in various parts of Siberia. The late Mr. Bell, to whom our Engliſh gardens are ſo much indebted for plants from that country, introduced this in 1785. It flowers in June and July, but is not ornamental. The *leaves* are an inch and a quarter long, about half as broad. *Flowers* white, very few in each *cyme*, compared with moſt of the ſpecies. *Corolla* with an elongated tube. In his firſt account of this plant, above cited, Pallas attributes five, ſix, or ſeven *ſeeds* to the *fruit*; in the ſecond he ſays one of his pupils impoſed upon him with a wrong ſpecimen, and that the real fruit of this ſhrub is an oval *berry*, red at firſt, then black, like *V. Lantana*, but more oblong, with a ſolitary, compreſſed, ribbed *ſeed*. He gives figures of theſe parts, with the *leaf* of a ſmaller variety, in his tab. 58. fig. F, G; which he calls tab. 7. Pallas further remarks, that the ſcattered pubeſcence of this ſpecies is ſtellated, and that a portion of ſuch is found on the *flower-ſtalks*; all which brings it nearer to the *Lantana*, a circumſtance hardly to be divined from his figure.

10. V. *dentatum*. Shining Tooth-leaved Viburnum. Linn. Sp. Pl. 384. Willd. n. 8. Ait. n. 5, α. Purſh n. 9. Jacq. Hort. Vind. v. 1. 13. t. 36.—Leaves roundiſh-ovate, acute, furrowed and ſomewhat plaited, ſtrongly toothed, nearly ſmooth on both ſides. Cymes ſtalked. Berries almoſt globular.—In mountainous woods frequent, from New York to Carolina, flowering in June and July, and known by the name of Arrow-wood. *Berries* dark blue. *Purſh*. The *leaves* of this ſpecies are three inches long, and nearly as broad, ſomewhat heart-ſhaped at the baſe; beſprinkled on the upper ſide with fine, ſimple, diſtant hairs; paler and ſmoother beneath. They are ſtrongly ribbed. *Flowers* rather ſmall, hairy in the middle. *Calyx* white as well as the *petals*.

11. V. *pubeſcens*. Downy Tooth-leaved Viburnum. Purſh n. 10. (V. dentatum β; Ait. n. 5. Willd. n. 8.)—Leaves ovate, pointed, furrowed and ſomewhat plaited, ſtrongly ſerrated; ſoft and downy beneath. Cymes ſtalked. Berries oblong.—In the lower parts of Virginia and Carolina, flowering in June. The whole of the ſhrub ſmaller than the preceding. *Purſh*. We have a ſpecimen of this from the Paris garden, marked *V. dentatum longifolium, Juſſ.* The *leaves* are downy on both ſides, but particularly ſoft at the back; their form oblong-ovate; length two or two and a half inches; margin ſharply ſerrated; tranſverſe veins numerous, divided. *Flowers* much like the laſt.

12. V. *plicatum*. Plaited Japaneſe Guelder-roſe. Thunb. Tr. of Linn. Soc. v. 2. 332. Willd. n. 9. (V. dentatum; Thunb. Jap. 122, excluding the reference to Linnæus. Fundàn, vulgò Te Mariqua; Kæmpf. Am. Exot. 854.)—"Leaves ovate, obtuſe, with tooth-like ſerratures, plaited."—Found by Thunberg near Fammamato, in Fakona, and other parts of Japan, flowering in April and May. The *flowers* are radiated, like our Guelder-roſe; but the *leaves*, as Kæmpfer obſerves, are rounder than in that ſpecies, with crowded ribs, and a ſerrated margin. Thunberg ſays the *leaves* are plaited, eſpecially before they fully expand; their form rounder, and their teeth finer, than in the true *V. dentatum*, n. 10.

13. V. *eroſum*. Jagged Japaneſe Viburnum. Thunb. Jap. 124. Willd. n. 10.—Leaves obovate, pointed, ſharply notched, nearly ſmooth. Footſtalks downy, as well as the cymes.—Native of Japan. *Branches* grey, ſomewhat ſpreading, ſmooth, except when young. *Footſtalks* ſlender, near an inch in length; Thunberg calls them very ſhort; we ſuſpect he wrote *petiolus* for *pedunculus*, (the common flower-ſtalk,) which is very ſhort, and downy like the *cyme*, (not *panicle* nor *umbel*,) which it ſupports. The *flowers* are numerous and crowded, but not radiated. *Leaves* pliant, ſtrongly veined, two or three inches long, dilated upwards.

14. V. *Lantana*. Mealy Guelder-roſe; or Way-faring Tree. Linn. Sp. Pl. 384. Willd. n. 11. Fl. Brit. n. 1. Engl. Bot. t. 331. Jacq. Auſtr. t. 341. (Viburnum; Matth. Valgr. v. 1. 194. Camer. Epit. 122. Lantana, ſive Viburnum; Ger. Em. 1490.)—Leaves heart-ſhaped, ſharply ſerrated, veiny; downy beneath, with ſtarry hairs. Cymes ſtalked, downy.—Native of hedges and thickets, in the more temperate

temperate parts of Europe, on a chalky or marly soil, flowering in May, and not rare in various parts of England, especially Oxfordshire. It has justly been described by Ray, as of a taller stature in the northern counties than in the south. In general it is a tufted bush, with round, pliant, mealy twigs. (See the explanation of the generic name.) All the *stalks*, the backs of the elliptic-heartshaped veiny *leaves*, and in some measure their upper surface, are clothed with dense, hoary, starry hairs, often loaded with dust from the road, which scarcely adds to the powdery aspect of the plant. *Flowers* white, in large, rather convex, stalked *cymes*. *Stigmas* sessile, very short and thick. *Berries* roundish, abrupt, compressed; when young red on the outermost side, yellow on the other; finally quite black, mealy and astringent, with a large, flat, furrowed *seed*. The *foliage* turns in autumn to a dark red.

14. V. *grandifolium*. Large-leaved, or American, Wayfaring Tree. (V. Lantana β, grandifolium; Ait. ed. 1. v. 1. 372. ed. 2. n. 6, β, by mistake called *grandiflorum*. Willd. n. 11, β. V. lantanoides; Michaux Boreal.-Amer. v. 1. 179. Pursh n. 11.)—Leaves roundish-heartshaped, abruptly pointed, unequally and obtusely serrated; their ribs and stalks downy, with starry hairs. Cymes quite sessile. Berries ovate.—In shady woods, on high mountains, from Canada to Virginia, principally in the forests called Beechwoods, flowering in June and July. Known by the name of *Hobble-bush*. *Berries* red; but when ripe, black. *Pursh*. Of more humble growth than the last, with more trailing *branches*, and larger greener *leaves*. Michaux has well separated it from the European *Lantana*, but we cannot adopt his barbarously-formed specific name, though too many such illiterate deformities are unaccountably introduced daily by more classical writers. The error of *grandiflorum*, for *grandifolium*, is one of those very few which escaped the late supremely accurate Dryander. It were an injury to his memory not thus to correct him.

15. V. *tomentosum*. Downy Japanese Viburnum. Thunb. Jap. 123. Willd. n. 12. (Sijo, vulgò Adsai, &c.; Kæmpf. Am. Exot. 854.)—"Leaves ovate, pointed, serrated, veiny; downy beneath. Cymes lateral."—Observed by Thunberg, in various woods between Miaco and Jedo, as well as cultivated, in Japan, flowering in April and May. The *branches* are round, smooth, reddish, divaricated, subdivided. *Leaves* ovate, (not heart-shaped,) ribbed; the upper ones most downy beneath. The youngest *branches*, and all the *stalks*, are downy. *Cymes* axillary, at the extremities of the small branches. *Flowers* radiant. *Thunberg*. Kæmpfer says the *flowers* are blue, composing a large dense ball, the outer ones largest.

16. V. *hirtum*. Hairy Japanese Viburnum. Thunb. Jap. 124. Willd. n. 13.—"Leaves ovate, serrated, villous. Footstalks hairy."—Native of Japan. *Stem* ascending in a zigzag manner, round, smooth; its *branches* alternate, round, smooth at the base, hairy at the extremity. *Leaves* opposite, resembling those of a nettle, acute, deeply and equally serrated, an inch long, veiny; the veins clothed with white close hairs. *Footstalks* and *flower-stalks* covered with horizontally spreading hairs. *Flowers* minute, not radiant. *Stigma* two-lobed. *Thunberg*.

17. V. *acerifolium*. Maple-leaved Viburnum. Linn. Sp. Pl. 384. Willd. n. 14. Ait. n. 7. Pursh n. 12. Venten. Jard. de Cels, t. 72.—Leaves three-lobed, pointed, sharply serrated; downy beneath. Footstalks hairy, without glands.—In rocky mountainous situations, from New England to Carolina, flowering in May and June. *Berries* black. *Pursh*. The *branches* are round, finely downy, with starry hairs. Such are found also on the *footstalks*, but intermixed with simple much coarser ones. The *leaves* are rather acutely lobed, and strongly serrated, very much resembling those of the Common Vine. *Stipulas* setaceous, in pairs on the base of each footstalk. *Cyme* of many downy branches, on a long terminal *common stalk*. *Flowers* not radiant. This appears by the manuscripts of the celebrated Peter Collinson, to have been imported by him in 1736.

18. V. *orientale*. Oriental Guelder-rose. Pallas Ross. v. 1. p. 2. 31. t. 58. f. H. Willd. n. 15. Opulus orientalis, folio amplissimo tridentato; Tourn. Cor. 42.)—Leaves three-lobed, pointed, coarsely and rather bluntly toothed. Footstalks smooth, without glands.—Native of rather alpine situations in Imiretta. *Pallas*. Differs from the last, to which it is very nearly akin, in having *leaves* strongly toothed, not serrated, and an oval *seed*, with three ribs and two furrows at each side, as in *V. Lantana*, instead of the heart-shaped seed of the *acerifolium*. *Willdenow*. *Berries* red. *Pallas*.

19. V. *Opulus*. Common Guelder-rose, Water Elder, or Snow-ball Tree. Linn. Sp. Pl. 384. Willd. n. 16. Fl. Brit. n. 2. Engl. Bot. t. 332. Fl. Dan. t. 661. (Sambucus aquatilis sive palustris; Ger. Em. 1424. S. aquatica; Camer. Epit. 977.)—Leaves three-lobed, sharply toothed. Footstalks smooth, furnished with glands. Cymes radiant.—Native of watery thickets and hedges throughout Europe, flowering in June. A small bushy *tree*, smooth in all its parts, only the backs of the *leaves* being occasionally downy. Their three lobes are unequally toothed or serrated. The *footstalks* bear, towards the top, several cup-like glands, and towards the base, a pair or two of linear *stipulas*. *Cymes* large, smooth, stalked, of numerous white *flowers*, the marginal ones abortive, dilated and radiant. *Berries* oval, drooping, scarlet, very succulent, not eatable. *Seed* heart-shaped. A variety with globose *cymes*, composed entirely of radiant *flowers*, is commonly cultivated in gardens and shrubberies, as a companion to the lilac and laburnum. The foliage turns in autumn to a beautiful pink or crimson, as in many genera of trees and shrubs that are principally American.

20. V. *molle*. Soft-leaved American Guelder-rose. Michaux Boreal.-Amer. v. 1. 180. Pursh n. 13. ("V. alnifolium; Marsh. Arb. 162.")—"Leaves roundish-heart-shaped, plaited, furrowed, toothed; downy beneath. Footstalks slightly glandular. Cymes radiant. Berry oblong-ovate."—In hedges in Kentucky, near Danville, as well as in Tennassee and Upper Carolina, flowering in June and July. *Berries* red. This species resembles the following. *Pursh*. The *leaves* are undivided, not three-lobed. The *flowers* are radiant. The *bark* falls off every year in thin shreds. *Michaux*.

21. V. *Oxycoccus*. Cranberry Guelder-rose. Pursh n. 14. (V. Opulus β; Ait. n. 8. Michaux Boreal.-Amer. v. 1. 180. "V. trilobum; Marsh. Arb. 162.")—Leaves three-lobed, acute at the base, three-ribbed; lobes divaricated, elongated, pointed, sparingly toothed. Footstalks furnished with glands. Cymes radiant.—In swamps and shady woods of Canada, and on the mountains of New York and New Jersey, flowering in July. *Berries* red, of an agreeable acid, resembling that of Cranberries, *Vaccinium macrocarpon*, for which they are a very good substitute. *Pursh*. We have never examined this species, though it probably may be found in the London nurseries. If the fruit answers to the above character, and is plentiful, it would be worth cultivating for the table. The *twigs* are described of a shining red.

22. V. *edule*. Smaller Eatable Guelder-rose. Pursh n. 15.

n. 15. (V. Opulus γ; Michaux Boreal.-Amer. v. 1. 180.)—Leaves three-lobed, bluntish at the base, three-ribbed; lobes very short, serrated with minute pointed teeth. Footstalks furnished with glands. Cymes radiant.—On the banks of rivers, from Canada to New York, flowering in July. A smaller and more upright shrub than the preceding species. *Berries* of the same colour and size, but, when completely ripe, more agreeable to eat. *Pursh.*

23. V. *dilatatum.* Spreading Japanese Viburnum. Thunb. Jap. 124. Willd. n. 17.—Leaves obovate, pointed, unequally toothed, villous. Cymes axillary.—Gathered by Thunberg in Japan. *Stem* shrubby, erect, somewhat angular, grey, villous. *Leaves* two inches long, stalked, ribbed, jagged at the margin, villous on both sides; the lower ones smaller. *Footstalks* round, villous, three-quarters of an inch long. *Cyme* axillary, repeatedly compound, four-cleft and three-forked, very widely spreading, with downy stalks. *Flowers* not radiant. *Thunberg.* The learned author uses the terms *panicle, umbel,* and *cyme* indifferently in his descriptions of this genus; but from what we have seen, even of his own species, we, without scruple, substitute the latter throughout.

24. V. *macrophyllum.* Large-leaved Japanese Viburnum. Thunb. Jap. 125. Willd. n. 18.—Leaves obovate, pointed, toothed, smooth. Cymes radiant, terminal. — Native of Japan. The whole plant is smooth. *Stem* and *branches* round. *Leaves* ribbed, paler beneath, four inches in breadth, and somewhat more in length. *Footstalks* one-third the length of the leaves. *Thunb.*

25. V. *cuspidatum.* Pointed-leaved Japanese Viburnum. Thunb. Jap. 125. Willd. n. 19.—Leaves ovate, pointed, serrated, villous. Cymes radiant.—From the same country as the two last. *Leaves* equally and acutely serrated, of the size of the preceding species, clothed with scattered hairs. *Cymes* terminal, repeatedly compound. *Thunb.*

26. V. *Lentago.* Pear-leaved Viburnum. Linn. Sp. Pl. 384. Willd. n. 20. Ait. n. 9. Pursh n. 3. — Leaves smooth, broad-ovate, pointed, finely and sharply serrated. Footstalks bordered, crisped. Cymes sessile.—Frequent in hedges, and on the borders of woods, from New England to Carolina, flowering in July. More inclined to grow to a tree than any of the rest of the American species. *Berries* black. *Pursh.* Cultivated in England, by Mr. James Gordon, in 1761. *Aiton.* The *leaves* are three inches long, and nearly half as broad, rather coriaceous, very smooth, with many transverse ribs. *Footstalks* channelled, with a curled dilated border at each side. *Buds* large, ovate, with a long point. We never saw the *flowers.*

27. V. *squamatum.* Scaly Viburnum. Willd. Enum. 327. (V. nudum; var. squamatum; Muhlenb. Catal. 32.)—" Leaves oblong, bluntly and finely serrated. Footstalks and flower-stalks clothed with scaly pubescence."—Native of Pennsylvania. A hardy shrub in the open air at Berlin. *Leaves* two inches long, with a very short point; their base somewhat contracted; their edges unequally, distantly, bluntly, and very slightly serrated; smooth, except the under side of the younger ones, which is besprinkled with small, brown, very distant, scales. *Footstalks*, as well as the long lanceolate *buds*, thickly covered with minute, brown, hairy scales. *Cyme* terminal, as in *V. nudum*, n. 5, which the present species greatly resembles; but it is distinguished by the scales of all the stalks, and the finely-serrated, less coriaceous, *leaves*, which are neither shining nor revolute. *Willdenow.*

28. V. *cassinoides.* Thick-leaved Viburnum. Linn. Sp. Pl. 384. Willd. n. 21. Ait. n. 10. Pursh n. 6.—Leaves ovato-lanceolate, acute at each end, smooth, crenate, slightly revolute. Footstalks keeled, without glands.—In swamps from New York to Carolina, flowering in June and July. *Berries* blueish-black. *Pursh.* The whole plant is smooth. *Leaves* two inches long, more or less, and one broad, coriaceous; paler beneath; the transverse ribs scarcely visible. *Footstalks* angular, gibbous at the base, but not decurrent. *Cymes* terminal, on short stalks.

29. V. *lævigatum.* Cassioberry Viburnum, or Paraguay Tea. Ait. n. 12. Willd. n. 23. Pursh n. 7. (Cassine Peragua; Linn. Mant. 220. C. foliis ovato-lanceolatis serratis oppositis deciduis, floribus corymbosis; Mill. Ic. 55. t. 83. f. 1. C. veræ perquam similis arbuscula, phillyreæ foliis antagonistis; Pluk. Mant. 40. Hortul. Angl. 16. t. 20.)—Leaves lanceolate, smooth, unequally serrated; entire at the base. Branches two-edged.—Found near the sea-coast, in Virginia and Carolina, flowering in June and July. *Berries* black. *Pursh.* The smooth wand-like *branches* are marked at each side with a narrow prominent line, running down from the insertion of the *footstalks*, which are rather short and thick, carinated, bordered, and somewhat crisped. *Leaves* scarcely two inches long, bluntish. *Cymes* at the ends of short lateral branches. *Flowers* white, not radiant. *Berries* globular, red.

30. V. *nitidum.* Shining Narrow-leaved Viburnum. Ait. n. 11. Willd. n. 22. Pursh n. 8.—" Leaves linear-lanceolate, very smooth, entire, or slightly serrated; shining above. Branches quadrangular."—In sandy barren woods of Carolina and Georgia. A low *shrub*, with small *leaves*. *Pursh.* Mr. Aiton speaks of it as hardy, flowering in May and June; cultivated in 1758, by Mr. Christopher Gray, who had at that time, and long before, a well-furnished nursery-ground at Fulham.

VIBURNUM, in *Gardening*, contains plants of the deciduous and evergreen flowering kind, among which the species cultivated are, the pliant mealy or wayfaring tree (V. lantana); the water elder or guelder rose (V. opulus); the pear-leaved viburnum (V. lentago); the thick-leaved viburnum (V. cassinoides); the shining-leaved viburnum (V. nitidum); the cassioberry bush (V. lævigatum); the oval-leaved viburnum (V. nudum); the plum-leaved viburnum (V. prunifolium); the tooth-leaved viburnum (V. dentatum); and the laurustinus, or laurustine (V. tinus).

The first is a thickly-branched shrub, the flowers of which are whitish, in large terminating, solitary, many-flowered cymes. It is sometimes known by the name of pliant mealy tree; and according to Withering, the bark of the root is used to make bird-lime.

There is a variety in North America with larger leaves, of a bright green; and with variegated leaves in nurseries.

The second sort is a small bushy tree, with numerous white flowers, smooth in all its parts, and very much branched.

There is an American variety, which is a shrub, that has the twigs of a shining-red colour, and which rises eight or ten feet high, with many side-branches, covered with a smooth purple bark: the leaves cordate-ovate, ending in acute points, deeply serrate, having many strong veins, and standing upon very long slender footstalks.

There is also another beautiful variety common in plantations, under the name of guelder-rose, bearing large round bunches of abortive flowers only, which rises to the height of eighteen or twenty feet, if permitted to stand: the stem becomes large; the branches grow irregular, and are covered with a grey bark: the leaves are divided into three or four lobes, somewhat like those of the maple; they are about three inches long, and two and a half broad, jagged on their edges, and of a light green colour: the

flowers come out in a large corymb, are very white, and being all neuters, are barren: from their extreme whiteness, and swelling out into a globular form, some country people have given this shrub the name of *snow-ball* tree. It is also sometimes called *elder rose*, and *rose elder*.

In the seventh sort there are varieties with deciduous and evergreen leaves.

The eighth sort has a woody stalk ten or twelve feet high, and is commonly called *black haw* in North America.

The ninth has the stalks soft, pithy, and branching, with white flowers.

There are varieties with the leaves smooth on both sides, and with the leaves downy underneath, and drawn out to a point.

In the tenth sort there are several varieties; as the smaller hairy-leaved, in which the umbels (cymes) of flowers are smaller, and appear in autumn, continuing all the winter. The plants are much hardier than in the original sort.

The shining-leaved, in which the stalks rise higher, and the branches are much stronger: the bark is smoother, and turns of a purplish colour; the leaves are larger, of a thicker consistence, and of a lucid green colour: the umbels (cymes) are much larger, and so are the flowers; these seldom appear till the spring, and when the winters are sharp, the flowers are killed, and never open unless they are sheltered.

There is a sub-variety of this with variegated leaves, with gold-striped and silver-striped; in which the branches are warted, the younger ones four-cornered; the leaves opposite, ovate, on short petioles, rigid, shining, perennial; the younger ones hirsute, with short ferruginous villose hairs: flowers in crowded cymes, with little bracteas between them: the corolla white; and the berries, when ripe, blue.

The common, with narrower leaves, hairy only on the edge and veins underneath: the fruit smaller.

And the upright laurustinus.

Method of Culture.—These plants may some of them be increased by seeds, most of them by layers, many by cuttings, and a few by suckers.

The seeds in the deciduous kinds should be sown in the autumn or spring in beds of light fine mould, being well covered in. The plants appear in the first or second year; and when they are of a twelvemonth's growth, they should be planted out in nursery rows, to be continued till of proper growth to plant out in the shrubberies or other parts of pleasure grounds, as from two to five feet.

In the laurustinus kinds, the seeds, after being mixed with mould in the autumn, soon after they become ripe, and exposed to the air and rain in the winter, should in the spring be sown on a gentle hot-bed, or in pots plunged into it; the plants being continued in the bed till the autumn, when they should be removed and managed as in the layer method. The plants raised in this way are said to be hardier than those raised from layers.

The first sort is tedious in being raised from seeds.

In the layer, which is the most expeditious mode of raising most of these plants, the young lower branches should be laid down in the autumn or spring, being pegged down in the usual manner in the earth, when they mostly become well rooted in a twelvemonth, and may then be taken off and planted out where they are to remain, or in the nursery; and sometimes, in some of the kinds, a few are put in pots.

The best season for removing the tenth sort is in the early autumn, that they may be well rooted before the winter sets in.

The first sort succeeds best by layers put down in the autumn; and the striped variety may be increased by budding it upon the plain sort.

The cuttings may be made in the autumn from the strong young shoots being planted in a moist border in rows, when in the following summer many of them will be rooted, and form little plants. Most of the deciduous sorts may be raised in this way.

The suckers should be taken up in the autumn or spring with root-fibres, and be planted out in nursery rows to have a proper growth. The guelder-rose may be readily increased in this way, and sometimes the laurustinus.

The fourth sort is rather tender in winter while in its young growth, as well as the sixth, and should have protection in that season. A plant or two should be constantly laid in pots under shelter. This last sort is easily increased by layers.

These plants afford much variety and effect in shrubbery and other parts of pleasure-grounds, when planted out in a mixed order. The evergreen sort are often used to cover disagreeable objects. The flowering evergreens are likewise often set out in pots. They are sometimes trained to a single stem, to the height of one or two feet, being encouraged to branch out into a close bushy round head. They should all mostly be permitted to take on their own natural growths, except the occasional retrenching of their lower straggling branches, and pruning the long shoots from their heads.

Viburnum-*Galls*, in *Natural History*, the name of a species of galls, or small protuberances, frequently found on the leaves of the viburnum. These are of a very singular nature, and seem to be composed of a different substance from that of the leaf. They appear in form of brown circular spots, of which there are sometimes forty or more on one leaf: they are about the fifteenth of an inch in diameter, and rise a little above the surface of the leaf, as well on the under as the upper side; each of them has also a small prominence in the centre, on each side of the leaf, looking like a nipple standing on the breast.

These are found in great plenty in the months of June, July, and August, and, when opened, each contains one insect, which is a small worm of a white colour, with six legs, and two hooks of a brown colour at the head.

M. Reaumur found that these worms became, in fine, a very small species of beetle. They were of a cinnamon colour, and had conic and granulated antennæ of a beautiful figure. Reaumur's Hist. Insects, vol. vi. p. 209.

VIC, in *Geography*, a town of France, and seat of a tribunal, in the department of the Meurte; 15 miles E. of Nancy.—Also, a town of France, in the department of the Vienne, on the Gartempe; 18 miles N. of Montmorillon.

Vic, or *Vicq*, a town of France, in the department of the Indre; 18 miles N. of Châteauroux.

Vic. See Vique.

Vic *Bigorre*, a town of France, and principal place of a district, in the department of the Upper Pyrenées; 18 miles E. of Pau. N. lat. 43° 22′. E. long. 8′.

Vic *en Carladez*, or *Vic sur la Cére*, a town of France, in the department of the Cantal, situated at the foot of the Cantal, with a medicinal spring; 21 miles W.S.W. of St. Flour.

Vic *le Comte*, a town of France, in the department of the Puy de Dôme. About half a league from the town is a medicinal spring; 6 miles S.W. of Billom.

Vic *Dessos*, a town of France, in the department of the Arriege; 6 miles S.W. of Tarascon.

Vic *Fezensac*, a town of France, in the department of the Gers; 12 miles S. of Condom.

VICAR, Vicarius, a person appointed as deputy of another,

another, to perform his functions in his absence, and under his authority.

The word is formed from *vicarius, qui alterius vices gerit.* The pope pretends to be vicar of Jesus Christ on earth. He has under him a *grand* vicar, who is a cardinal; and whose jurisdiction extends over all priests, both secular and regular; and even, in many cases, over laymen.

Apostolical vicars are those who perform the functions of the pope in churches or provinces which he has committed to their direction.

Among the ancient Romans, *vicarius*, vicar, was a legatus, or a lieutenant, sent into the provinces where there was no governor; so that the vicarii were properly the emperor's vicars, not those of governors. Cod. de Offic. Vicar.

Italy, in the time of the eastern empire, was governed by two vicarii: the one *vicar of Italy*, who resided at Milan; the other *vicar of the city*, who resided at Rome.

Cujas observed, that the word vicar was sometimes, though rarely, attributed to the lieutenant-generals of proconsuls, or governors of Roman provinces.

VICAR, in the *Canon Law*, denotes a priest of a parish, the predial tithes of which are impropriated or appropriated; that is, belong either to a chapter, religious house, &c. or to a layman, who receives them, and only allows the vicar the smaller tithes, or a convenient salary, anciently called *portio congrua*.

He is thus called, *quasi vice fungens rectoris*, as serving for, or in lieu of, rector, who would be entitled to the great tithes.

Hence, the part or portion of the parsonage allotted to the vicar, for his maintenance and support, or the promotion or living which he has under the parson, is called a *vicarage*. This part or portion is, in some places, an annual sum of money certain; but in most places, it is a part of the tithes in kind, which most commonly is the small tithes; and in some places he has a part of the great tithes, and also of the glebe.

The stipend of vicars was formerly at the discretion of the appropriators; but, on account of their neglect, it was enacted by 15 Rich. II. c. 6. that in all appropriations of churches, the diocesan bishop should ordain (in proportion to the value of the church) a competent sum to be distributed among the poor parishioners annually, and that the vicarage should be sufficiently endowed. However, the vicar was liable to be removed at the pleasure of the appropriator; and, therefore, by 4 Hen. IV. c. 12. it is ordained, that the vicar shall be a secular person, not a member of any religious house; that he shall be vicar perpetual, not removable at the caprice of the monastery; and that he shall be canonically instituted and inducted, and be sufficiently endowed, at the discretion of the ordinary, for these three express purposes, to do divine service, to inform the people, and to keep hospitality. Institution and induction seem to be the specific difference between a vicar and a perpetual curate; both can only be in a church that was appropriated. But this must be understood, only where the curacy is parochial; for as to curates of chapels, there seems to be no similitude between them and curates of parishes. In appropriated churches, where no vicar has been endowed, the officiating minister is appointed by the appropriator or impropriator, and is called perpetual curate. The endowments in consequence of these statutes have usually been by a portion of the glebe, or land belonging to the parsonage, and a particular share of the tithes, called small or vicarial *tithes*; which see. Some, however, were more liberally, and some more scantily endowed; and hence many things, as wood in particular, is in some countries a rectorial, and in some a vicarial title. The distinction therefore of a parson and vicar is this: that the parson has generally the whole of all the ecclesiastical dues in his parish; but a vicar has generally an appropriator over him, entitled to the best part of the profits, to whom he is in effect a perpetual curate, with a standing salary. Though in some places the vicarage has been considerably augmented by a large share of the great tithes; which augmentations were greatly assisted by the statute 29 Car. II. c. 8. enacted in favour of poor vicars and curates, which rendered such temporary augmentations (when made by the appropriators) perpetual. See AUGMENTATION. Blackst. Comm. book i.

A vicar who has a part of the great tithes, and also of the glebe, is called a *vicar endowed*.

These vicars were anciently called *perpetui vicarii;* because not appointed by the impropriator, and licensed by the bishop to read service; but presented by the patron, and canonical institution given them by the hands of the ordinary; and so having constant succession, or corporations, and never dying.

The act of endowment by the bishop might be made either in the act of appropriation, or by a subsequent act or separate instrument. Upon the making of an appropriation, an annual pension was reserved to the bishop and his successors, commonly called an indemnity, and payable by the body to whom the appropriation was made. See APPROPRIATION and IMPROPRIATION.

A vicarage by endowment becomes a benefice distinct from the parsonage. As the vicar is endowed with separate revenues, and is now enabled by the law to recover his temporal rights without aid of parson or patron; so hath he the whole cure of souls transferred to him, by institution from the bishop. It is true, in some places, both the parson and the vicar do receive institution from the bishop to the same church as it is in the case of sinecures; the original of which was thus: The rector (with proper consent) had a power to entitle a vicar in his church to officiate under him; and this was often done; and by this means two persons were instituted to the same church, and both to the cure of souls, and both did actually officiate. So that however the rectors of sinecures, by having been long excused from residence, are in the common opinion discharged from the cure of souls (which is the reason of the name); and however the cure is said in the law-books to be in them *habitualiter* only; yet in strictness of law, and with regard to their original institution, the cure is in them *actualiter*, as much as it is in the vicar. Gibs. 719. Cro. Jac. 518. 1 Sid. 426.

The parson, by making the endowment, acquires the patronage of the vicarage. For in order to the appropriation of a parsonage, the inheritance of the advowson was to be transferred to the corporation to which the church was to be appropriated; and then, the vicarage being derived out of the parsonage, the parson of common right must be patron thereof. So that if the parson makes a lease of the parsonage (without making a special reservation to himself of the right of presenting to the vicarage), the patronage of the vicarage passeth as incident to it. (2 Roll. Abr. 59.) But it was held in the 21 Jac. that the parishioners may prescribe for the choice of a vicar. And before that, in the 16 Ja. it was declared by the court, that though the advowson of the vicarage of common right is appendant to the rectory, yet it may be appendant to a manor; as having been reserved specially upon the appropriation. Gibs. 719. Moore, 894. 2 Roll. Rep. 304.

Sometimes, upon appropriation, the right of presenting the

the vicar was given to the bishop, probably to induce his consent: as appeareth from divers instances.

There were no vicarages at common law; or, in other words, no tithes or profits of any kind do *de jure* belong to the vicar, but by endowment or prescription; which cannot be presumed, but must be shewn on the part of the vicar. For which reason, the payment of tithes to the parson is *prima facie* a discharge against the vicar. Gibs. 719. Palm. 113. Yelv. 86. 4 Mod. 184.

The first endowment of the vicars cannot be prescribed against by the parson. Which original endowments therefore being of such authority as no time can destroy; and such causes between parson and vicar as relate to them, or depend on them, being also cognizable in the spiritual court: it were much to be wished, says Dr. Gibson, for the sake of the poor vicars, that diligent search were made after them in the ecclesiastical offices, and other repositories of records; in order to bring to light as many as can possibly be found. Especially, since it hath been also adjudged, that if a vicar hath used time out of mind, or for a long time, to take particular tithes or profits, he shall not lose them, because the original endowment is produced and they are not there: but inasmuch as every bishop had an indisputable right to augment vicarages as there was occasion, and this, whether such right was reserved in the endowment or not; the law will presume, that this addition was made by way of augmentation. Gibs. 720.

The loss of the original endowment is supplied by prescription; that is, if the vicar hath enjoyed this or that particular tithe by constant usage, the law will presume that he was legally endowed with it; by the same reason that it presumes some tithes might be added, by way of augmentation, which were not in the original endowment. Gibs. 720. 2 Keb. 729. Hardr. 328.

It is said that all compositions for the endowments of vicarages shall be expounded by the judges of the common law; and if the spiritual court meddle with that matter, they are to be prohibited. Wats. c. 39. Lit. Rep. 263.

But where the dispute is between rector and vicar, being both spiritual persons, it seemeth that the proper cognizance of the cause belongeth to the ecclesiastical judge. 2 Brownl. 36. See, however, Moore, 457.

But the courts of equity frequently determine upon the interpretation of endowments.

The canonists mention four species of vicars: some *perpetual;* others, appointed for a certain time, and on some special occasion, called *mercenarii:* others, called *speciales*, appointed not for the whole cure, but for some certain place, article, or act: others, *generales*, neither perpetual, nor appointed for any certain act, but for all things in the general.

Vicar-*General* was a title given by Henry VIII. to Thomas Cromwell, earl of Essex; with full power to oversee the clergy, and regulate all matters relating to church-affairs.

Vicar-*General* is now the title of an office, which, as well as that of official principal, are united in the chancellor of the diocese. The proper work of an official is to hear causes between party and party, concerning wills, legacies, marriages, and the like; which are matters of temporal cognizance, but have been granted to the ecclesiastical courts by the concessions of princes: whereas that of a vicar-general is the exercise and administration of jurisdiction purely spiritual, by the authority and under the direction of the bishop, as visitation, correction of manners, granting institutions, and the like, with a general inspection of men and things, in order to the preservation of discipline and good government in the church. These two offices have been ordinarily granted together; but Dr. Gibson wishes they might be still kept separate; the office of vicar-general to be vested in the hands of some grave and prudent clergyman, usually resident within the diocese; and that of official (as being conversant about temporal matters) in the hands of a layman, well skilled in the civil law.

VICARDI, the name of an office in the island of Candia. The word is probably a corruption of the Latin *vicarii.* The vicardi is the governor of a village, and is sometimes the parish priest; his office is to levy the public taxes, and to send offenders to the cadic. This office is always appointed yearly. Pococke's Egypt, vol. ii. part ii. p. 12.

VICARELLO, in *Geography*, a town of the Popedom, in the Patrimonio, near the lake of Bracciano, celebrated for its baths; 3 miles N.W. of Bracciano.

VICARIO *deliberando occasione cujusdam recognitionis*, &c. in *Law*, an ancient writ that lies for a spiritual person imprisoned.

VICARO, in *Geography*, a town of Naples, in Capitanata; 9 miles S.E. of Volturara.

VICE, Vitium, in *Ethics*, is ordinarily defined an elective habit, deviating either in excess, or defect, from the just medium in which virtue is placed.

It is called a *habit*, to distinguish it from *sin*, which is only an act: hence, a *sin* is looked upon as something transient; and a *vice*, as something permanent.

In the common use of the terms vice and sin, there is no ground for this subtle distinction. Vice, as opposed to virtue, is better defined the disagreement of the actions of any intelligent being with the nature, circumstances, and relation of things; hence called the moral unfitness of such actions. See Virtue.

Some authors distinguish three states of vice: the first *incontinentia*, of incontinence, in which a person sees and approves the good, but is hurried to evil by the violence of his passions. The second *intemperantia*, of intemperance; in which even the judgment is depraved and perverted; the third *feritatis*, of obduracy; in which the person is totally immersed in vice, without any sense or feeling of it.

The state of incontinency is considered as infirmity, in which the person feels the sharpest stings of conscience: that of intemperance, as malice, in which the remorse is not so lively. In that of obduracy there is none.

Vice, in *Smithery*, and other arts employed in metals, is a machine, or instrument, serving to hold fast any thing they are at work upon, whether it be to be filed, bent, or rivetted, &c.

The parts of the vice are, the *face*, or *plane*, which is its uppermost part; the *chaps*, which are cut with a bastard-cut, and well tempered; the *screw-pin*, cut with a square, strong worm; the *nut*, or *screw-box*, which has a square worm, and is brased into the round box; the *spring*, which throws the chaps open; and the *feet*, on which the whole is mounted.

Vice, *Hand*, is a small kind of vice, serving to hold the less works in, that require often turning about.

Of this there are two kinds, the *broad chapt hand-vice*, which is that commonly used; and the *square-nosed hand-vice*, seldom used but for filing small round work.

Vice is also a machine used by the glaziers, to turn, or draw lead into flat rods, with grooves on each side, proper to receive the edges of the glass.

This machine consists of two iron chaps, or cheeks, joined with two cross iron pieces. In the space between the chaps are two steel wheels, and their spindles, or axes, passed through the middle, each of which has its nut or pinion with teeth, that catch into each other; and to the lowest is fitted a handle, by which the machine is turned.

There

There are some of these vices double, and that will draw two leads at once: these have three wheels. Some glaziers will turn lead of different sizes in the same vice; by changing their cheeks for each size.

With another pair of spindles, whose nuts almost meet, they turn lead for *tiers;* which, when it comes out of the vice, is almost cut asunder, in two thicknesses, easy to be parted. Before the invention of this vice, they used a plane: accordingly, in all the ancient windows, we find the lead planed and grooved that way.

Vice is also used in the composition of divers words, to denote the relation of something that comes instead, or in the place, of another.

In this sense the word is Latin, *vice*, stead, place, turn, &c.

Vice-*Admiral*. See Admiral.

Vice-*Chamberlain*, called also, in ancient statutes, *under-chamberlain*, is an officer in the court, next under the lord-chamberlain; and who, in his absence, has command and controul of all officers belonging to that part of the household called the *chamber* above stairs.

Vice-*Chancellor* of an university is an eminent member, chosen annually to manage affairs in the absence of the chancellor.

Vice-*Comes*, in *Law*. See Viscount.

Vice-*Comitem*, *Accedas ad*. See Accedas.

Vice-*Comitis*, *Respectu habendo computi*. See Respectu.

Vice-*Consul*, an officer who discharges the duty of a consul, under his orders or during his absence.

Vice-*Doge* is a counsellor of Venice, who represents the doge when sick, or absent; that the signory may never be without a chief.

The vice-doge never takes the ducal chair, nor bears the horn, nor is addressed under the title of *serenissimo:* yet the foreign ambassadors, speaking to the college, use the common apostrophe of *serenissimo principe;* and he performs all the offices of doge, and gives answers to ambassadors, without moving his cap.

Vice-*Dominus*, a viscount, sheriff, or vidame.

Vice-*Dominus Abbatiæ*, or *Ecclesiæ*, in the *Civil* and *Canon Law*, an advocate, or protector, of an abbey or church. See Advocate.

Vice-*Dominus Episcopi*, in the *Canon Law*, is the commissary or vicar-general of a bishop.

Vice-*Gerent*, *Vicegerent*, a vicar, deputy, or lieutenant.

Vice-*Legate*, an officer whom the pope sends to Avignon, and some other cities, to perform the office of a spiritual and temporal governor, at a time when there is no legate, or cardinal, to command there.

All the Gaul Narbonnoise, as Dauphiné, Provence, &c. has recourse to the vice-legate of Avignon, for all ecclesiastical dispatches; in like manner as the other provinces address themselves to Rome. See Legate.

Vice-*Roy*, a governor of a kingdom, who commands therein in the name and stead of a king, with full and sovereign authority.

Thus, when Naples and Sicily were subject to Spain, vice-roys were sent thither; and the name is now given to those who govern in Mexico and Peru.

The lord-lieutenant of Ireland is also sometimes called the vice-roy.

Vice-*Versâ*, a Latin phrase, frequently retained in English writings; signifying as much as *on the contrary*.

Thus, as the sun mounts higher and higher above the horizon, insensible perspiration increases; and, *vice versâ*, as he descends lower, it diminishes.

VICEGRAD, or Vissegrad, in *Geography*, a town of Hungary, near the Danube, with a castle, formerly the residence of the kings of Hungary. It was enlarged, and magnificently fitted up by Charles I., who, in 1310, ordered the royal crown to be deposited here. In this castle likewise he entertained John, king of Bohemia, and his son Casimir, king of Poland, and Nemagna, king of Bosnia and Servia. After the death of Louis II. it was taken by the Turks, since which it has been neglected; 9 miles S.S.E. of Gran.

VICENNALIS, in *Antiquity*, something of twenty years, or that returns after twenty years.

Among the Romans, *vicennalia* particularly denoted the funeral feasts, held on the twentieth day after a person's decease.

Vicennalia, or *Vicennales Ludi*, were also games, feasts, and rejoicings, held every twentieth year of the reign of a prince.

On medals we frequently meet with *vicennalia vota;* the vows put up on that occasion for the safety of the emperor and the enlargement of the empire.

These are expressed by vot. x. & xx, in the medals of Tacitus, Gallienus, and Probus; vot. x. m. xx, in those of Valerius Maximianus and Galerius Maximianus; vot. x. mul. xx, in those of Constantine, Valentinian, and Valens; vot. x. mult. xx, in those of Dioclesian, Constantine, Julian, Valentinian, Theodosius, Arcadius, Honorius; votis x. mult. xx, in those of Julian, Valentinian, Gratian; vot. x. sic. xx, in those of Valerius Constantius; vot. xii. fel. xx, in the younger Licinius; vot. xv. fel. xx, in Constantine.

VICENTE, or Vincent, *St.*, in *Geography*, a province of Brasil, containing the noted republic of *St. Paul* (which see); and as this is the first province in which the Portuguese established themselves, so it was one of the most fertile, till the discovery of the mines diverted the channels of commerce. It is now chiefly remarkable for hams, esteemed equal to any in Europe; and, if Estalla may be credited, for tanned hides of large swine.

VICENTIA, Vicenza, in *Ancient Geography*, a town of Italy, in Venetia, upon the Medoacus Minor (the Barchiglione). Of its foundation nothing is known; but it appears to have been a Roman colony, and municipal. The partisans of Vespasian took possession of it, A.D. 69. Tacitus, Hist. l. iii. c. 8.

VICENTIN, in *Geography*, a country of Italy, bounded on the north by the Tyrolese, on the east by the Trevisan and the Paduan, on the south by the Paduan, and on the west by the Veronese and Tyrolese; about 45 miles in length, and from 10 to 24 in breadth. This territory was formerly a part of Lombardy. It is partly hilly, and partly flat; but in general uncommonly pleasant and fertile. The plains abound in all kinds of corn, fruit, and mulberry-trees; and the mountainous parts afford good pastures, and most excellent wine, called "vino santo." The breeding of cattle is so very considerable here, that the country of Vicenza is proverbially called the shambles of Venice. The sheep are in tolerable plenty, and the wool is excellent. The culture of silk is so important, that it produces annually upwards of 200,000 pounds of that article; there are also silver and iron mines, medicinal springs, paper, and saw-mills, which are abundantly provided with timber from the forests. Fish and venison are in abundance. The hill Sumano is celebrated on account of the great variety of salubrious herbs which grow there; and on the other hills petrified shells and fish are found, some of which differ entirely from those that live in the Adriatic sea. The larger rivers and rivulets are the Astico, Agno or Gua, the Temonchio,

monchio, the Cerifon, and Tergola, all which run into the river Bachiglione, and difcharge themfelves afterwards into the Po. The territory of Vicenza belonged formerly to ancient Venetia, and in the fequel raifed itfelf to the rank of one of the thirty duchies of Lombardy, and was incorporated by Charlemagne with the Marca Trevifana. In the progrefs of time, the country of Vicenza affumed again a republican form; and in the 13th century, fell under the dominion of the tyrant Ezzelin. After his death, it came under the government of Padua, from which it was taken by the family of Scala, who were again difpoffeffed of it by John Galeazzo Vifconti, duke of Milan. It did not, however, remain long in his hands; for in the year 1404, it refcued itfelf from the government of Milan, and fubmitted voluntarily to the republic of Venice. In the year 1796, it became part of the Auftrian monarchy, in virtue of the peace of Campo Formio. This province comprehends one city, 13 fmall towns and boroughs, and upwards of 300 villages. The whole population amounts, according to the laft enumeration made by the French, to 286,000 fouls.

VICENTINO, Don Nicolo, in *Biography*, publifhed at Rome, 1555, a work in quarto, entitled "L'Antica Mufica ridotta alla moderna Prattica," or "Ancient Mufic reduced to modern Practice," with precepts and examples for the three genera and their fpecies; to which is added, an account of a new inftrument for the moft perfect performance of mufic, together with many mufical fecrets.

During the 16th century, and a great part of the next, many of the moft eminent mufical theorifts of Italy employed their time in fubtle divifions of the fcale, and vifionary purfuits after the ancient Greek genera; nor was this rage wholly confined to theorifts, but extended itfelf to practical muficians, ambitious of aftonifhing the world by their deep fcience and fuperior penetration, though they might have employed their time more profitably to themfelves, and the art they profeffed, in exploring the latent refources of harmonic combinations and effects in compofition, or in refining the tone, heightening the expreffion, and extending the powers of execution, upon fome particular inftrument. Thefe vain inquiries certainly impeded the progrefs of modern mufic; for hardly a fingle tract or treatife was prefented to the public, that was not crowded with circles, fegments of circles, diagrams, divifions, fubdivifions, commas, modes, genera, fpecies, and technical terms, drawn from Greek writers, and the now unintelligible and ufelefs jargon of Boethius.

Vicentino, by the title of *Don* prefixed to his name, feems to have been an ecclefiaftic of the Benedictine order. He was a practical mufician, and appears to have known his bufinefs. In his treatife he has explained the difficulties in the mufic of his time, with fuch clearnefs, as would have been ufeful to the ftudent, and honourable to himfelf, if he had not fplit upon enharmonic rocks, and chromatic quickfands. He gives a circumftantial account of a difpute between him and another mufician at Rome, Vincentio Lufitanio, who maintained that modern mufic was entirely diatonic; while Vicentino was of opinion, that the prefent mufic was a mixture of all the three ancient genera, diatonic, chromatic, and enharmonic. This difpute having produced a wager of two gold crowns, the fubject was difcuffed in the pope's chapel, before judges appointed by the difputants, and determined againft Vicentino; whether juftly or unjuftly, depends upon the precife fenfe affigned to the term *chromatic* by the feveral difputants.

What ufe was made of the enharmonic genus in the mufic of the 16th century, we know not; but whenever other founds are ufed than thofe of the fcale, ftrictly diatonic, by introducing F, C, or G fharp, or any flat, except that of B, which the Greeks themfelves allowed in the fynemmenon tetrachord, and the moft fcrupulous writers upon canto-fermo, in the modes of the church, the diatonic is mixed with the chromatic; and to this licence the firft contrapuntifts were reduced, at a cadence in D and A minor, as well as G major.

Though Vicentino loft his wager by the decifion of the judges againft him, he recovered his honour fome time after, by his antagonift, Lufitanio, recanting, and coming over to his opinion. According to Kircher, Vicentino was the firft who imagined that the proportions or ratios of the ancient diatonic genus were inadmiffible in our counterpoint; and tried in his work to eftablifh the tetrachord to confift of a major, femitone, and two tones, one major and one minor; which forms the diatonic fyntonus of Ptolemy, which Zarlino has propagated, and which is now in general ufe.

VICENZA, in *Geography*, a city of Italy, and capital of the Vicentin, fituated at the union of two fmall rivers, in a plain, between two hills. The celebrated architect, Andrea Palladio, was born and lived here. Among the buildings are feen feveral regular ftately palaces, and other elegant edifices, particularly the council-houfe, the grandeur of which is heightened by two very lofty columns, with St. Mark's winged lion on one of them, and on the other the image of our Saviour. The Monte della Pieta is a ftately fabric, and has a very fine library. Of the churches, which are 57 in number, 14 are parochial, and 29 conventual, with feveral good hofpitals. The cathedral ftrikes the eye with nothing particular. The great altar of the Dominican church is a moft auguft piece of Palladio's architecture, as is alfo the beautiful convenient theatre in the building where the Academia Olympicorum meets. The feats are difpofed in the manner of the ancient amphitheatre, and the perfpective is furprifingly beautiful, chiefly by reafon of the many ftatues of Roman emperors, and fome philofophers. This academy is a fociety of men of learning, who meet at ftated times, for the improvement of the Italian language. By the fame fkilful architect is likewife the copy of the triumphal arch of the Campo Martio, without the city, erected for the embellifhment of the public walk. The church della Madonna di Monte, on a mountain, without the city, is much frequented by pilgrims, and poffeffes a fine frontifpiece, with a convent built clofe by. The Scaligeri were once for a confiderable time lords of this city; afterwards it paffed through feveral hands, and, in 1304, fubmitted to the republic of Venice; 35 miles W. of Venice. N. lat. 45° 31'. E. long. 11° 22'.

VICES, a term ufed by the dealers in horfes to exprefs certain faulty habits or cuftoms in that creature, which render him troublefome to the rider, and are never to be worn off, but by attention to the regular methods.

The following are the tricks generally underftood as vices by dealers, and their methods of preventing, correcting, and curing them.

1. If a horfe carry his head or neck awry, ftrike him twice or thrice with the fpur on the contrary fide; but if he be very ftiff-necked on the right fide, and very plying or bending on the left, the rider is to hold the right rein fhorter than the other, and give him fudden checks every time he inclines that way, having a fharp wire faftened in the reins, that ftriking in his neck, he may be compelled to hold it ftraight; but in this, care muft be always taken to check him upwards, for otherwife he will get a habit of ducking his head, which will prove very troublefome.

2. If a horfe is apt to fhake his head and ears upon the leaft occafion, or move his ears when he is going to kick or bite,

bite, or caſt his rider; the way of curing this is to ſtrike him on the head with a wand, as ſoon as he ſhews the firſt attempt to it; and, at the inſtant of ſtriking him, he is to be checked with the bridle, and ſtruck with the ſpur on the contrary ſide: this will put him out of his pace, and he is then to be ſtopped, that he may have leiſure to underſtand the rider's meaning. Every time that he ſtarts or winces, which are ſignals that he is going to bite, or to ſtrike with his heels, the ſame is to be done, and he will, by degrees, be broke of theſe habits.

3. If a horſe is ſubject to ducking down his head frequently, the rider muſt, every time he is guilty of it, check him ſuddenly with his bridle, and at the ſame time ſtrike him with the ſpurs, in order to make him ſenſible of his fault. If he be ſtanding, he is thus to be made to bring his head in the right place as he ſtands; and when he does ſo, he is to be cheriſhed, that he may underſtand the rider's meaning, which, in time, he will certainly do.

4. If a horſe be ſkittiſh, and apt to ſtart, ſo that the rider is never free from danger while on his back, the cauſe of the malady is firſt to be carefully inquired into: if it be found to proceed from a weak ſight, which repreſents objects to him other than they really are; the method of curing him is, every time he does it, to give him leiſure to view the things, and ſee what they really are; he muſt have time to view them well, and then be rid gently up to them. If, on the contrary, his ſkittiſhneſs depends on his being naturally fearful, and alarmed at every noiſe, he is to be cured of it by the inuring of him to loud noiſes of many kinds, as firing of guns, drums, trumpets, and the like; and he will, in time, come to take delight in that of which he was before afraid.

5. If a horſe be reſtive, and refuſe to go forward, the rider is to pull him backwards, and this will often occaſion his going forward: this is uſing his own fault as a means of reclaiming him. The rider is firſt cautiouſly to find whether this vice proceeds from real ſtubbornneſs, or from faintneſs: if from the latter, there is no remedy but reſt; but if actual ſtubbornneſs be the fault, the whip and ſpur, well employed, and perſiſted in, will at length be found a certain cure.

6. If a horſe rear up an end; that is, if he riſes ſo high before as to endanger his coming over the rider, the horſeman muſt give him the bridle, and bear forwards with his whole weight. As he is going down, he ſhould have the ſpur given him very roundly; but this muſt by no means be done as he is riſing, for then it will make him riſe higher, and probably come over.

7. If a horſe be ſubject to lie down in the water, or upon the ground, there is no better remedy than a pair of ſharp ſpurs reſolutely applied. But there is ſome caution to be uſed in the application of them, for bad horſemen generally are the occaſion of the faults in horſes, by correcting them out of due time.

The proper moment of ſpurring is juſt when he is going to lie down; but when this has diverted him from the thought of it, he is not immediately to be ſpurred again. For the doing this frightens the creature, and puts him into confuſion to that degree, that he at length becomes reſtive, and thus one fault is only changed for another, and that perhaps a worſe.

8. If a horſe be apt to run away, very cautious means muſt be uſed to break him of it. The rider muſt be gentle, both with a ſlack curb, and keeping an eaſy bridle-hand. He is firſt to be walked without ſtopping him; but only ſtaying him, by degrees, with a ſteady, not a violent hand, and always cheriſhing him when he obeys: when he is thus made very manageable in his walk, he is to be put to his trot, and finally to his gallop; and from theſe he is to be brought into a walk again, always by degrees, and ſtaying him with a ſteady hand. By uſing this method from time to time, with judgment and patience, it is probable he may at length be cured.

9. If a horſe is apt to fly out violently, it is certain, that the more the bridle-rein is pulled, and the more he is hurt by tugging the curb, the faſter he will run: the beſt method is therefore, if there be field-room enough, to let him go, as ſoon as he is going, by ſlackening the bridle, and giving him the ſpur continually and ſharply, till he ſlacken of his own accord. Thus, by degrees, he will find that himſelf is the ſufferer by all his flights, and he will then leave them off, though he could be never broke of them any way elſe.

10. Some horſes will not endure the ſpurs when they are given them, nor ever go forwards; but faſtening themſelves to them, they will ſtrike out and go back; and if they are preſſed more hard, they will fall to ſtaling without ever going out of the place. If the horſe who has this vice be a gelding, it will prove very difficult to cure him of it. A ſtone-horſe, or mare, are much eaſier cured; but even theſe will be trying at it again afterwards; and if they ever get the better of their rider, they will not fail to keep it up in this particular.

Every horſe, of whatever kind, that has this fault of cleaving to the ſpurs, as the jockeys call it, and not going forwards with them, is to be rejected, in the buying for any gentleman's riding, for it is a ſign of a reſtive nature, and is a fault generally accompanied with many others.

VICESIMATIO, in *Roman Antiquity*. See DECIMATION.

VICH, in *Geography*, a river of Ruſſia, which runs into the Oby, N. lat. 61° 20′. E. long. 76° 14′.

VICHEREY, a town of France, in the department of the Voſges; 9 miles E. of Neufchâteau.

VICHNOU, or VISNE, in *Mythology*, a deity in the Eaſt Indies, of whom the Brachmans have a tradition, that he was metamorphoſed into a tortoiſe; and they explain this fable by ſaying, that by the fall of a mountain the world began to ſtagger and to ſink down gradually towards the abyſs, where it would have periſhed, if their beneficent god had not transformed himſelf into a tortoiſe to bear it up. See VISHNU.

VICHY, in *Geography*, a town of France, in the department of the Allier, on the Allier; near it are ſome medicinal ſprings; 3 miles S.W. of Cuſſet.

VICIA, in *Botany*, the Vetch, an old Latin name, is by ſome etymologiſts derived from *vincio*, to bind together, as the various ſpecies of this genus twine, with their tendrils, round other plants. De Theis traces this word to its Celtic ſynonym, *Gwig*, whence alſo, according to him, comes the modern Greek name of the vetch, βίκιον or βίκος.—Linn. Gen. 376. Schreb. 497. Willd. Sp. Pl. v. 3. 1093. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 768. Prodr. Fl. Græc. Sibth. v. 2. 69. Ait. Hort. Kew. v. 4. 310. Purſh 471. Juſſ. 360. Tourn. t. 221. Lamarck Illuſtr. t. 634. Gærtn. t. 151. (Faba; Tourn. t. 212.)—Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, erect, cloven half way down into five acute ſegments; the upper ones ſhorteſt, converging; all of equal breadth. *Cor.* papilionaceous. Standard oval, with a broad oblong claw; its ſummit emarginate with a ſmall point; the ſides reflexed; the back marked with a longitudinal, compreſſed, elevated line. Wings two, oblong, erect, half-heartſhaped, ſhorter than the ſtandard, with oblong claws. Keel ſhorter than the

the wings, half-orbicular, compreffed, with a divided oblong claw. *Stam.* Filaments in two fets, one fimple, the other in nine divifions; anthers erect, roundifh, with four furrows. A nectariferous gland, fhort and pointed, arifes from the receptacle, between the compound filament and the germen. *Pist.* Germen linear, compreffed, long; ftyle fhorter, thread-fhaped, bent upwards at a right angle; ftigma obtufe, tranfverfely bearded underneath. *Peric.* Legume long, coriaceous, of one cell and two valves, terminating in a point. *Seeds* feveral, roundifh.

Obf. *Faba* of Tournefort has oval compreffed feeds. *Vicia* of that author and Rivinus has roundifh feeds.

Eff. Ch. Stigma tranfverfely bearded on the under fide.

An extenfive genus of herbaceous, perennial or annual plants, climbing by means of tendrils, which terminate the common footftalk of their abruptly pinnated *leaves*. It is nearly akin to LATHYRUS, (fee that article,) differing effentially in the *ftigma*, and in a generally more flender habit, with fmaller, more oblong, *flowers*. The fpecies are moftly natives of Europe, a few of Barbary, and North America, fcarcely any occurring in tropical climates. The *flowers* are axillary: either racemofe on a longifh common ftalk; or nearly feffile, folitary or two or three together; their colour crimfon, purplifh, or pale yellowifh, rarely white or blue.

Sect. 1. *Flower-ftalks elongated.*

1. V. *pififormis.* Pea Vetch. Linn. Sp. Pl. 1034. Willd. n. 1. Ait. n. 1. Jacq. Auftr. t. 364. (Pifum fylveftre; Cluf. Hift. v. 2. 229. P. perenne fylveftre; Ger. Em. 1220. Cracca flore ochroleuco; Rivin. Tetrap. Irr. t. 52.)—Stalks many-flowered. Leaflets ovate; the lower pair clofe to the ftem.—Native of woods in Hungary, Auftria, Germany, Switzerland, and near Conftantinople; a hardy perennial, flowering in July and Auguft in our botanic gardens. The *ftem* is angular and ftriated, branched, climbing to the height of feveral feet. *Leaves* of three or four pair of not quite oppofite, broad, blunt, fmooth *leaflets*, about an inch long, all on very fhort partial ftalks, attached to a ftraight *footftalk* from three to five inches in length, which ends in a branched tendril; the loweft pair largeft, and clofe to the *ftipulas*, which are ovate, acute, with an awl-fhaped defcending lobe. *Flower-ftalks* half as long as the leaves, each bearing a denfe clufter of numerous, oblong, pale-yellowifh *flowers*, all drooping one way. *Legume* an inch and half long, near half an inch broad, fmooth, veiny, of a rufty brown.

2. V. *caroliniana.* Carolina Vetch. Walt. Carol. 182. Willd. n. 2. Purfh n. 5. (V. parviflora; Michaux Boreal.-Amer. v. 2. 69.)—Stalks with many diftant flowers. Leaflets numerous, elliptic-lanceolate, nearly fmooth. Stipulas ovato-lanceolate, entire. Stem fmooth.—Native of mountians in North America, from Pennfylvania to Carolina, flowering in July and Auguft. Refembles *V. Cracca*, but the *flowers* are white, with a black-tipped *ftandard*, and a great deal fmaller. *Purfh.* The *ftem* is angular, furrowed. *Leaflets* eight or ten, not quite oppofite. *Stipulas* fmall. *Clufters* three inches or more in length, of above twenty flowers, hanging all one way. *Walter, Willdenow.*

3. V. *pontica.* Euxine Vetch. Willd. n. 3. (V. multiflora fpicata, floribus albidis, calyce purpureo; Tourn. Cor. 27.)—Stalks with many crowded flowers. Leaflets numerous, lanceolate. Stipulas lanceolate-fwordfhaped, entire. Stem downy.—Native of the country near the Euxine fea. *Stem* angular and furrowed. *Tendrils* of the leaves three-cleft. *Leaflets* from twenty to twenty-feven, elliptic-lanceolate, an inch or more in length, bearing, on the under fide efpecially, many fcattered clofe-preffed hairs. *Stipulas* almoft half an inch long, hairy, ribbed. *Clufters* fix inches, the lower ones a foot, in length. *Flowers* drooping, crowded, the fize of *V. Cracca.* *Willdenow.*

4. V. *dumetorum.* Great Wood Vetch. Linn. Sp. Pl. 1035. Willd. n. 4. Ait. n. 2. (V. n. 427; Hall. Hift. v. 1. 185. Cracca fylvatica; Rivin. Tetrap. Irr. t. 51.)—Stalks many-flowered. Leaflets reflexed, ovate, pointed. Stipulas fomewhat toothed.—Native of France, Switzerland, Germany, and the neighbourhood of Conftantinople; a hardy perennial, flowering in May or June, but feldom cultivated here, except for curiofity. The *leaflets* are fmaller, more numerous, and more alternate than in the firft fpecies, the lower one only fituated near the bafe of their common *footftalk*. *Flowers* fewer, and much larger, purple, not yellow. *Legumes* lanceolate, tapering at each end.

5. V. *fylvatica.* Common Wood Vetch. Linn. Sp. Pl. 1035. Willd. n. 5. Fl. Brit. n. 1. Engl. Bot. t. 79. Fl. Dan. t. 277. (V. n. 426; Hall. Hift. v. 1. 185. t. 12. f. 2. V. multifora maxima perennis, tetro odore, floribus albentibus, lineis cæruleis ftriatis; Plnk. Phyt. t. 71. f. 1.)—Stalks many-flowered, longer than the leaves. Leaflets numerous, elliptical. Stipulas lunate, with capillary teeth.—Native of rather mountainous woods and thickets, in Sweden, Germany, France, and England, flowering in July and Auguft. An elegant plant, with a branching perennial *root*. The *ftems* are much branched, climbing over bufhes, which they decorate with long-ftalked *clufters* of white *flowers*, delicately ftriated with purplifh-blue. The *leaflets* are fcattered, fmooth, blunt, or emarginate, with a fmall point; their length from a quarter to half an inch. *Legume* lanceolate, pointed, fmooth, with about four *feeds*. This fpecies is well worthy of a place in gardens and fhrubberies. In the north of England it often makes a beautiful appearance in hedges and mountain thickets, flowering copioufly for feveral weeks.

6. V. *americana.* American Wood Vetch. Muhlenb. Cat. 65. Willd. n. 6. Purfh n. 3.—Stalks with feveral flowers, fhorter than the leaves. Leaflets elliptic-lanceolate, obtufe, fmooth. Stipulas half-arrowfhaped, deeply toothed.—Difcovered in Pennfylvania, by the late Rev. Dr. Muhlenberg, from whom we have a fpecimen. It flowers in May, and is perennial. Purfh compares this fpecies with *V. fylvatica*, as to the fize of its *flowers* and general refemblance. But the *leaflets* are rather larger, fomewhat toothed. *Stipulas* with deep, but not capillary fegments. *Flowers* much fewer, their common ftalks never longer than the leaves.

7. V. *grandiflora.* Large-flowered Vetch.—Stalks with feveral flowers, fhorter than the leaves. Leaflets ovate, fmooth. Stipulas lunate, with fharp teeth. Calyx-teeth taper-pointed.—Gathered by Mr. Menzies, at the upper edge of the foreft, on the mountain called *Mowna-rooa*, in Owhyhee, which is 6000 feet high. This magnificent fpecies is much larger than any of the preceding. Its *leaflets*, near an inch and half long, are the fhape of *V. dumetorum*, but twice as large. *Flowers* pale purple, full thrice the fize of *dumetorum*; their *ftandard* and other *petals* all ftrongly recurved. *Calyx* half as long as the *corolla*, with long, very finely pointed, teeth. The *clufters* are lax, with flender, fomewhat downy, partial *ftalks*, three-quarters of an inch in length. We have not feen the *legume*.

8. V. *variegata.* Parti-coloured Oriental Vetch. Willd. n. 7. Prodr. Fl. Græc. n. 1700. (V. orientalis multiflora argentea, flore variegato; Tourn. Cor. 27.)—Stalks with many imbricated flowers. Leaflets elliptical, villous. Stipulas deeply divided at the bafe, ovato-lanceolate.—Native of

of the Levant. *Tournefort.* Found by Dr. Sibthorp in the Peloponneſus. His ſpecimens anſwer well to Willdenow's deſcription, except that the *leaves*, though clothed with ſhining hairs, are ſcarcely "whitiſh, or ſilvery." The *ſtems* are about a foot high, ſquare, ſtriated, villous. *Leaflets* from fourteen to twenty, obtuſe; thoſe of the lower *leaves* obovate, emarginate, pointed, crowded. *Tendrils* ſhort, cloven. *Common ſtalk* dilated, ſemi-cylindrical. *Stipulas* pointed. *Cluſters* rather longer than the leaves. *Flowers* the ſize of *V. ſativa*, turned all one way.

9. V. *caſſubica.* Caſſubian Vetch. Linn. Sp. Pl. 1035. Willd. n. 8. Ait. n. 4. (V. Gerardi; Jacq. Auſtr. t. 229. V. pedunculis multifloris, petiolis polyphyllis, foliolis villoſis, ſtipulis acutis integris appendiculatis; Gerard Gallopr 497. t. 19, excellent. V. multiflora caſſubica fruteſcens, lentis ſiliquâ; Pluk. Phyt. t. 72. f. 2.)—Stalks many-flowered, ſhorter than the leaves. Leaflets elliptic-oblong, ſlightly downy. Stipulas lanceolate, entire, with a divaricated awl-ſhaped ſpur at the baſe.—Native of mountainous woods and meadows, in Provence, Pomerania, and Auſtria. Perennial, flowering in June, and ripening ſeed in Auguſt. This, it ſeems, has been formerly confounded with *V. ſylvatica*, but the *ſtems* are only about eighteen inches high, erect, not climbing. The whole of the herbage is ſomewhat downy. *Leaflets* very numerous, oppoſite or alternate, obtuſe or emarginate. *Stipulas* narrow, with a capillary point. *Flowers* light purple, from ſix to twenty, drooping, the ſize and ſhape of *V. ſylvatica*. *Legumes* ovate, hardly an inch long, likewiſe reſembling thoſe of the *ſylvatica*. The name *caſſubica*, taken from a province of Pomerania, is extremely exceptionable, for a plant found in ſo many different countries.

10. V. *atropurpurea.* Dark-purple Vetch. Desfont. Atlant. v. 2. 164. Willd. n. 9.—Stalks many-flowered, ſhorter than the leaves. Calyx-teeth briſtle-ſhaped, very villous. Leaflets lanceolate, villous. Stipulas half-arrowſhaped, deeply toothed. Legume hairy.—Native of the iſles of Hyeres, and of Algiers. Annual. The whole plant is villous. *Stem* ſquare, ſtriated. *Leaflets* from eight to twelve, bluntiſh, pointed. *Stipulas* ovate, with deep, linear-lanceolate, pointed teeth. *Calyx* clothed with long ſpreading hairs. *Corolla* of a deep blood-red. *Legume* covered with ſhort reddiſh hairs. Very different from the following ſpecies. *Willdenow.*

11. V. *villoſa.* Villous Vetch. Roth Germ. v. 2. part 2. 182. Hoſt. Syn. 399. Willd. n. 10.—"Stalks longer than the leaves, with many imbricated flowers. Leaflets oblong-ovate, villous. Stipulas half-arrowſhaped, ovate; bluntly toothed at the baſe."—Native of Germany, Auſtria, and Hungary. Reſembles *V. Cracca*, but the *root* is annual; *flowers* larger; *ſtem* weaker; *herbage* more villous; *legumes* twice as broad, and half as long again, as in that ſpecies, with *ſeeds* twice as large, grey covered with ſooty powder, not black and ſmooth. *Roth.*

12. V. *polyphylla.* Many-leaved Vetch. Desfont. Atlant. v. 2. 162. Willd. n. 11. Sm. Fl. Græc. Sibth. t. 699, unpubliſhed. (V. orientalis multiflora incana, anguſtiſſimo folio; Tourn. Cor. 27. Buxb. Cent. 5. 46. f. 35.)—Stalks longer than the leaves, many-flowered. Leaflets linear-lanceolate, acute, downy. Stipulas half-haſtate, lanceolate, entire.—Native of Hungary, Greece, mount Hymettus, and Barbary. Perennial. *Stems* branched, angular, climbing, clothed, like the reſt of the herbage, with ſoft ſilky hairs. *Leaflets* very numerous, near an inch long. *Stalks* rather longer than the leaves, each bearing a cluſter of larger, leſs numerous and crowded *flowers*, than in the following. *Calyx-teeth* very unequal. *Standard* ſky-blue, with purple veins. *Wings* and *keel* white; the latter tipped with violet. *Legume* oblong, ſmooth.

13. V. *Cracca.* Tufted Vetch. Linn. Sp. Pl. 1035. Willd. n. 12. Fl. Br. n. 2. Engl. Bot. t. 1168. Purſh n. 4. Curt. Lond. faſc. 5. t. 54. Mart. Ruſt. t. 117. Fl. Dan. t. 804. (Cracca; Rivin. Tetrap. Irr. t. 50.)—Stalks the length of the leaves, with many imbricated flowers. Leaflets lanceolate, bluntiſh, downy. Stipulas half-arrow-ſhaped, moſtly entire. Found in thickets, hedges, and fields throughout Europe, as well as in North America, flowering in July and Auguſt, when the denſe *cluſters* of numerous blue *flowers* make a handſome appearance. The *petals* are all blue; *flowers* more crowded; *leaflets* ſhorter and rather blunter than in the laſt. In the *ſtipulas* we find no permanent difference, the lower lobe being more or leſs divaricated or deflexed. Curtis juſtly remarked that the *ſtigma* is hairy all round.

14. V. *tenuifolia.* Slender-leaved Vetch. Roth Germ. v. 2. pt. 2. 183. Willd. n. 13. Ait. n. 6. Donn Cant. ed. 5. 176.—"Stalks longer than the leaves, with many imbricated flowers. Leaflets linear, three-ribbed, ſmoothiſh. Stipulas linear, entire."—Native of ſandy hillocks in Germany, as well as in Tauris. Said to be very like the preceding; but of a more humble and upright growth. The lower *ſtipulas* only are half-haſtate; the upper ones ſimple and linear. *Flowers* fewer in each cluſter, always violet-coloured. *Legumes* about half as large. *Roth.*

15. V. *onobrychioides.* Saint-foin Vetch. Linn. Sp. Pl. 1036. Willd. n. 14. Ait. n. 7. Allion. Pedem. v. 1. 325. t. 42. f. 1. (V. onobrychidis flore; Bauh. Prodr. 149.)—Stalks longer than the leaves, with many diſtant flowers. Leaflets linear, rather abrupt, ſmooth. Stipulas lanceolate, deeply toothed at the baſe.—Native of Switzerland, Italy, the ſouth of France, Greece, Cyprus, and the Archipelago, flowering in ſummer. The *root* is annual. *Herb* branched, climbing, with the habit of *V. Cracca*, but ſmooth, and much more variable in ſize, as well as in the breadth of the *leaflets*, which are moreover ſometimes acute, ſometimes obtuſe or abrupt, always tipped with a briſtly point. *Flowers* thrice as large as in *Cracca*, fewer and more remote, parti-coloured with crimſon and white. *Legume* an inch and half long, lanceolate, pointed, with many ſmall *ſeeds*.

16. V. *biennis.* Biennial Vetch. Linn. Sp. Pl. 1036. Willd. n. 15. Ait. n. 8. (V. n. 9; Gmel. Sib. v. 4. 10. t. 2.)—Stalks much longer than the leaves, with many ſcattered flowers. Leaflets elliptic-lanceolate, ſmooth. Common footſtalks angular, furrowed. Stipulas half-arrow-ſhaped, ſtalked.—Native of Siberia. A tall, ſmooth, biennial plant. *Leaflets* ribbed, an inch and quarter or inch and half long. *Flowers* half the ſize of the laſt, whitiſh, with a blue *ſtandard*.

17. V. *altiſſima.* Tall Vetch. Desfont. Atlant. v. 2. 163. Willd. n. 16.—"Stalks many-flowered. Leaflets about twelve, elliptical, abrupt, ſmooth. Stipulas toothed."—Native of Barbary, in hedges near Arzeau. Akin to the foregoing, but the abrupt *leaflets*, and toothed *ſtipulas*, diſtinguiſh it. *Desfontaines.* We would obſerve that nothing is more variable than the termination of the *leaflets* in this tribe; yet we do not diſpute the diſtinctneſs of the preſent ſpecies. The *herb* is perennial, perfectly ſmooth throughout, ſix feet high. *Flower-ſtalks* longer than the leaves, angular. *Flowers* numerous, pale blue, ſcarcely larger than in *V. ſepium*; ſee the ſecond ſection.

18. V. *Bivonæ.* Blue Sicilian Vetch.—Stalks as long as the leaves, about three-flowered. Leaflets elliptical, obtuſe, hairy. Stipulas lunate, deeply toothed. Legume oblong, reticulated,

reticulated, smooth.—Native of Sicily, from whence it was sent us by the baron Bivona Bernardi. Akin to several of the foregoing, but decidedly distinct. *Root* perennial. *Stems* several, climbing, eighteen inches or more in height, sharply angular, hairy like the rest of the herbage. *Leaflets* half or three quarters of an inch long, pale green, rather silky. *Flowers* two, three, or four on each stalk, light purplish-blue, much shorter than those of *V. Cracca*. *Calyx-teeth* all remarkably long, tapering, finely fringed. *Legume* an inch and quarter long, half an inch broad, flat, with four or five *seeds*.

19. V. *nissoliana*. Red Oriental Vetch. Linn. Sp. Pl. 1036. Willd. n. 17. Ait. n. 9.—Stalks shorter than the leaves, with few flowers. Leaflets elliptic-oblong, obtuse, downy. Stipulas lanceolate, entire. Legumes compressed, ovate-oblong, silky.—Native of the Levant. A hardy annual, said to have been first introduced at Kew, in 1773, by the celebrated earl of Bute. The whole plant is downy, or somewhat silky. *Leaflets* an inch long, tapering at the base into little partial stalks. *Stipulas* narrow, undivided. *Flowers* five or six, dark purple, the size of the last. *Calyx-teeth* long and slender, but not quite so long in proportion to the tube as in that species. *Legume* above an inch long, flat, very silky, with four or five large prominent *seeds*. Linnæus cultivated this species at Upsal. We have never observed it in any collection here.

20. V. *benghalensis*. Bengal Vetch. Linn. Sp. Pl. 1036. Willd. n. 18. Ait. n. 10. (V. benghalensis, hirsuta et incana, siliquis pisi; Herm. Lugd.-Bat. 623. t. 625. Cracca benghalensis; Rivin. Tetrap. Irr. t. 50.)—Stalks shorter than the leaves, about three-flowered. Leaflets elliptic-oblong, obtuse, downy. Stipulas lanceolate, entire. Legume turgid, oblong, silky.—Native of Bengal, from whence sir Joseph Banks procured seeds for the Kew garden, in 1792. An annual stove-plant, flowering in June and July. This is nearly related to the last, in general habit, pubescence, *stipulas*, and *calyx*; but the *flowers* are scarcely more than three; their *petals* longer, said to be of a very deep scarlet, at least their upper half, the *keel* tipped with black. We have not seen them, except dried. The *legume* differs essentially from the foregoing, having concave valves, like a *Pisum*, with five large round *seeds*.

21. V. *canescens*. Hoary Syrian Vetch. Billard. Syr. fasc. 1. 17. t. 7. Willd. n. 19. Ait. n. 11.—Stalks many-flowered, about the length of the leaves, which scarcely bear tendrils. Leaflets elliptic-lanceolate, downy. Stipulas half-arrowshaped. Legume turgid, oblong, silky.—Gathered by La Billardiere, towards the summit of mount Lebanon, and by Sibthorp in Greece. Sir Joseph Banks sent seeds to Kew in 1800. If this and the two preceding exist at present, in any garden, they ought to be figured in one, not both, of our periodical works. The present is marked as a hardy annual, flowering in July and August. The whole *herb* is hoary with soft down. *Stem* erect, a foot or more in height, square, striated. Lower *leaves* numerously pinnate, with an odd leaflet, in whose place the upper ones have only a short straight point, or abortive tendril. *Flowers* blue, full as large as the last, and more numerous. *Legume* swelling as in that, downy, but with fewer *seeds*.

22. V. *capensis*. Cape Vetch. Berg. Cap. 215. Willd. n. 20. Thunb. Prodr. 125.—Stalks elongated, many-flowered. Leaves pinnate with an odd leaflet, without tendrils; silky beneath. Stipulas lanceolate, undivided.—Native of the Cape of Good Hope. Perennial. *Stem* a span high, erect, angular, smooth; branched at the base; the *branches* short, procumbent. *Leaflets* about twenty-one, linear, abrupt with a point, or slightly emarginate; smooth above; scarcely half so long as the finger-nail. *Stipulas* membranous, ovate or lanceolate, simple and entire. *Clusters* roundish, hairy, rather dense, on long stalks. *Calyx-teeth* lanceolate, acute, nearly equal. *Bergius*. Linnæus has made a manuscript note in this author's book, saying "this plant resembles *Hippocrepis comosa*, but it has a *racemus*, not an *umbella*. It cannot be a *Vicia*, because of the odd leaflet."—The last remark is invalidated by *V. canescens*, n. 21. We have seen no specimen, on which to found any opinion.

23. V. *pellucida*. Transparent Vetch. Jacq. Hort. Schoenbr. v. 2. 50. t. 222. Willd. n. 21.—Stalks shorter than the leaves, with several flowers. Leaves pinnate with an odd leaflet, without tendrils, downy. Stipulas lanceolate, undivided. Legume falcate, many-seeded.—Native of the Cape of Good Hope. Jacquin's figure answers so well to the remark of Linnæus under the last species, that we are much inclined to think the present is the very same plant. Willdenow indeed, who had seen a dried specimen of the former, thought them distinct; but he indicates no material difference. The *flowers* of Jacquin's plant have a roundish, elegantly striated, *standard*, with purple *wings* and *keel*. The *legume* is compressed, curved, near two inches long, with ten or more *seeds*, separated by transverse strictures. Bergius has not described the *fruit* of his plant.

24. V. *fruticosa*. Willd. n. 22. (Lathyrus tomentosus; Cavan. Ic. v. 1. 58. t. 84. Orobus tomentosus; Desfont. Tabl. 224.)—Stalks shorter than the leaves, two-flowered. Leaves abruptly pinnate, without tendrils, downy. Stipulas awl-shaped, undivided. Legume straight, downy, many-seeded.—Found on hills near Huanuco, in Peru. A shrub, flowering in the Madrid garden from July to November. The *stem* is two feet high, with numerous, drooping, downy, round *branches*. *Leaflets* about twenty pair, elliptical, uniform, entire, a quarter of an inch long, without an odd one, or any terminal point. *Flowers* yellow, in shape and size not unlike the last, nor is the *legume* very dissimilar, except being straight, and gradually dilated upwards.—We feel little confidence as to the genus of this plant, but a certain resemblance to the two last, notwithstanding the want of an odd *leaflet*, induces us to retain it here. Perhaps they might all three, if all distinct, be removed from *Vicia*, and on more complete examination and comparison, might form a genus.

25. V. *biflora*. Two-flowered Sharp-leaved Vetch. Desfont. Atlant. v. 2. 166. t. 197. Willd. n. 24. Ait. n. 13.—Stalks two-flowered, shorter than the leaves. Leaflets linear, tapering at each end. Tendrils divided. Stipulas half-arrowshaped.—Native of Algiers. A hardy annual, sent to Kew, by M. Thouin, in 1801, flowering from June to August. The *stem* is slender, angular, procumbent. *Leaflets* eight or ten, alternate, very narrow. *Stipulas* minute, occasionally toothed. *Stalks* slender, bearing one or two rather large, oblong, blue *flowers*, and tipped with a small point. *Calyx-teeth* rather short. *Corolla* most like *V. benghalensis*, or *biennis*, in shape and dimensions.

26. V. *ciliaris*. Fringed Vetch. Sm. Prodr. Fl. Græc. Sibth. n. 1706. Fl. Græc. t. 700, unpublished.—Stalks single-flowered, pointed, as long as the leaves. Leaflets emarginate. Stipulas in many setaceous segments.—Gathered by Dr. Sibthorp in Asia Minor, probably near Smyrna. We know not whether the *root* be annual or perennial. The *stems* are weak, climbing, two or three feet long, branched, angular. *Leaflets* about seven pair, half an inch long, smooth. *Tendrils* many-cleft. *Stipulas* lunate, very remarkable for their numerous, spreading, almost capillary, segments. Point of the *flower-stalk* elongated three-quarters of an inch beyond the *flower*, which is therefore lateral,

lateral, about the ſize of the laſt, pale blue ſtreaked with purple. *Legume* an inch long, elliptical, acute, compreſſed, with two *ſeeds*.

27. V. *graminea*. Graſſy-leaved Vetch.—Stalks about four-flowered, ſhorter than the leaves. Leaflets linear, pointed, ſmooth. Stipulas ovate, entire, ſlightly half-arrow-ſhaped.—Gathered by Commerſon, at Buenos Ayres. We do not find any account of this ſpecies, a ſpecimen of which was given by Thouin to the younger Linnæus. The whole *herb* is nearly or quite ſmooth. *Stem* two feet or more in height, ſlender, angular, furrowed, ſcarcely branched. *Leaves* remote, each of three pair of very narrow *leaflets*, above an inch long, with a ſimple or divided tendril at the end of their common ſtalk. *Flowers* very ſmall, pale, apparently tinged with purple. *Calyx* a little downy, the teeth ſhorter than the tube. *Legume* ſmooth, compreſſed, not an inch in length, elliptic-oblong, with an oblique incurved point, and ſix or ſeven ſmall round *ſeeds*.

28. V. *longifolia*. Long-leaved Vetch. Poiret in Lam. Dict. n. 15.—Stalks much longer than the leaves, with many diſtant flowers. Leaflets numerous, linear, elongated, ſmooth. Stipulas lanceolate, half-arrowſhaped, entire.—Gathered in Syria, by La Billardiere. *Stems* ſtraight, angular, ſtriated, ſtiff, ſmooth, branched. *Leaflets* from ſixteen to twenty, alternate, diſtant, very narrow, an inch and a half long, ribbed, entire. *Stipulas* narrow and acute. *Tendrils* in two or three diviſions. *Flowers* yellowiſh-white, drooping, in very looſe *cluſters*. *Legume* not obſerved. *Poiret*.

29. V. *oroboides*. Four-leaved Vetch. Wulf. in Jacq. Coll. v. 4. 323. Willd. n. 25. Hoſt. Syn. 399. (Orobus pannonicus quartus; Cluſ. Hiſt. v. 2. 231.)—Stalks about four-flowered, ſhorter than the leaves. Leaflets two pair, ovate, pointed, without a tendril. Stipulas half-arrow-ſhaped, toothed at the ſide.—Found by Wulfen, in the mountainous woods of Carinthia and Carniola, flowering in May and June. We have ſpecimens from Jacquin. The *root* is perennial, tuberous. *Stems* erect, a foot and half high, ſimple, leafy, angular, ſtrongly furrowed, ſmooth. *Leaves* of two pair of large, ſmooth, reticulated *leaflets*, an inch, or inch and half, long, with a ſmall awl-ſhaped ſtipulaceous point in the place of a tendril. Cluſius's figure erroneouſly repreſents an odd leaflet here and there. *Flowers* an inch long, yellow, with a purpliſh *calyx*, about four together, in ſhort, lax, axillary *cluſters*.

For *V. Ervilia*, Willd. n. 23. ſee Ervilia and Ervum. We are now convinced that this plant is an *Ervum*.

Sect. 2. *Flowers axillary, nearly ſeſſile*.

30. V. *ſativa*. Common Vetch. Linn. Sp. Pl. 1037. Willd. n. 26. Fl. Brit. n. 3. Engl. Bot. t. 334. Purſh n. 2? Mart. Ruſt. t. 116. Fl. Dan. t. 522. (Vicia; Rivin. Tetrap. Irr. t. 54. Ger. Em. 1227. Lob. Ic. v. 2. 75. Camer. Epit. 320.)

β. Fl. Brit. V. anguſtifolia; Willd. n. 28. Rivin. Tetrap. Irr. t. 55. (V. lathyroides; Hudſ. 318, α. Dickſ. H. Sicc. faſc. 4. 12. V. ſylveſtris, ſive Cracca major; Ger. Em. 1227. V. globoſa; Retz. Obſ. faſc. 3. 39? Willd. n. 27?)

γ. Fl. Brit. (V. ſylveſtris, flore ruberrimo, ſiliquâ longâ nigrâ; Raii Syn. 321. V. anguſtifolia; Sibth. Oxon. 224. V. folio anguſtiore, flore rubro; Dill. Giſſ. append. 47.)

Legumes ſeſſile, ſolitary or in pairs, nearly erect. Lower leaves with abrupt leaflets. Stipulas toothed, marked with a dark depreſſion.—Native of cultivated ground, and graſſy paſtures, throughout Europe, flowering in May and June. A very variable annual plant, more or leſs hairy, diſtinguiſhed by a brown or blackiſh depreſſed mark on each *ſtipula*, which is viſible in all the ſuppoſed varieties; but we are not ſure that thoſe varieties may not be ſpecifically diſtinct; at leaſt our γ, which is characterized by its long, cylindrical, black *legumes*, and very elegant crimſon ſolitary *flowers*. The *leaflets* of *V. ſativa*, uſually from four to ſix pair, vary much in breadth; thoſe of the lower *leaves* are ſhorter, abrupt, or even inverſely heart-ſhaped; the reſt lanceolate or linear; all tipped with a briſtle. *Tendril* of the common ſtalk long and branched. *Flowers* variouſly ſhaded with red and blue. *Legume* compreſſed, rough, or a little downy, with many globoſe, or ſlightly lenticular, very ſmooth *ſeeds*. The uſe of this plant for fodder is well known. The *ſeeds* are the favourite food of pigeons.

31. V. *amphicarpa*. Subterraneous Vetch. Dorthes in Journ. de Phyſ. v. 35. 131. Willd. n. 29. (Aracus ὄμοιον; Cluſ. Exot. 87. t. 88.)—Legumes ſolitary, ſeſſile; the lower ones ſubterraneous, ovate. Leaflets linear, abrupt, three pair. Stipulas half-arrowſhaped, toothed.—Native of Provence. *Root* annual. *Stems* a ſpan long, diffuſe, angular. *Leaves* ſlightly hairy, with more or leſs of a tendril. *Flowers* crimſon, moſt like *V. ſativa* γ. *Legume* lanceolate, acute, above an inch long, with many *ſeeds*. Such is the ordinary fructification; but ſeveral *flowers* are produced from ſubterraneous leafleſs ſtalks. Theſe are very ſmall, conſiſting of a cloſed colourleſs *calyx*, in which, when examined againſt the light with a magnifying glaſs, *ſtamens* may diſtinctly be ſeen. Each of theſe *flowers* produces an oval-pointed *legume*, with one very perfect *ſeed*. *Orobus ſaxatilis*, Venten. Jard. de Cels, t. 94, may poſſibly be this plant, though the author did not obſerve its two-fold fructification. Many perſons have taken the preſent *Vicia* for *Lathyrus amphicarpos*, which exhibits a ſimilar phenomenon, but is widely diſtinct in other reſpects.

32. V. *puſilla*. Small American Vetch. Muhlenb. Cat. 65. Willd. n. 30. Purſh n. 1.—Stalks ſolitary, capillary, ſingle-flowered. Legumes oblong, ſmooth. Leaflets about ſix, linear-lanceolate, bluntiſh. Stipulas half-arrowſhaped, entire.—Found by the Rev. Mr. Muhlenberg, in Pennſylvania, and New Jerſey. Mr. Purſh ſays, it grows in low graſſy grounds, from Pennſylvania to Virginia, flowering in July and Auguſt. The *flowers* are exceedingly ſmall, white, with a tinge of red. *Purſh*. *Root* annual. *Stem* four or five inches high, aſcending. *Tendril* of the lower *leaves* ſimple, of the upper divided, and very long. *Legume* ſmall. *Willdenow*.

33. V. *lathyroides*. Spring Vetch. Linn. Sp. Pl. 1037. Willd. n. 31. Fl. Brit. n. 4. Engl. Bot. t. 30. Jacq. Miſc. Auſtr. v. 2. 299. t. 18. Fl. Dan. t. 58. Hudſ. 319, γ. (V. minima; Rivin. Tetrap. Irr. t. 55. Ervum ſoloniense; Linn. Sp. Pl. 1040.)—Legumes ſeſſile, ſolitary, ſmooth. Leaflets about ſix; the lower ones abrupt. Stipulas half-arrowſhaped, nearly entire. Seeds cubical, tuberculated. Native of France, Britain, Norway, and the Levant. With us it grows in fallow fields, or graſſy paſtures, on a gravelly or chalky ſoil, flowering in April and May; at which time of the year it may always be found in Hyde-park, near Kenſington gardens. The *root* is annual, though beſet with red fleſhy tubercles. *Herb* downy, or rather ſilky. *Stems* procumbent, ſpreading, from three to ſix inches long. *Tendrils* ſimple, generally very ſhort, or wanting. *Leaflets* moſtly inverſely heart-ſhaped; thoſe about the top of the ſtem more oblong and narrower. *Stipulas* not marked, and ſeldom toothed. *Flowers* ſmall, blueiſh. *Legume* erect, very ſmooth, by which, and eſpecially the cubical rough *ſeeds*, this long-obſcure ſpecies is at any time to be known from all the varieties of *V. ſativa*. Sometimes the *flowers* are

are white, or ſtriated. The *tendrils* are never divided, nor the *leaflets* more than ſix.

34. V. *lutea.* Rough-podded Yellow Vetch. Linn. Sp. Pl. 1037. Willd. n. 32. Fl. Brit. n. 5. Engl. Bot. t. 481. (V. flore ochroleuco, filiquis hirſutis propendentibus; Moriſ. ſect. 2. t. 21.)—Legumes ſolitary, nearly ſeſſile, reflexed, hairy. Stems diffuſe. Stipulas coloured. Standard ſmooth.—Native of the pebbly ſea-ſhores of the ſouth and eaſt of England, as well as of France, Spain, Italy, Barbary, Greece, and the Levant, flowering in July and Auguſt. The *root* is perennial and creeping, much divided. *Stems* diffuſe, not much branched, ſmooth, angular, ſtriated, from one to two feet long. *Leaflets* numerous, elliptic-oblong, hairy beneath; ſometimes abrupt. *Tendrils* much branched. *Stipulas* triangular, brown or reddiſh. *Flowers* long, pale yellow, ſtreaked or ſtained with grey or purple. *Legumes* ovate, pointed, an inch and half long, rough with hairs ſpringing from ſmall tubercles. *Seeds* from five to eight. Some of the *flowers* and *legumes* are often ſubterraneous, as in *V. amphicarpa*, n. 31.

35. V. *hybrida.* Hairy-flowered Yellow Vetch. Linn. Sp. Pl. 1037. Willd. n. 33. Fl. Brit. n. 6. Engl. Bot. t. 482. Jacq. Auſtr. t. 146.—Legumes ſolitary, nearly ſeſſile, reflexed, hairy. Standard villous. Leaflets emarginate.—Native of buſhy places in Auſtria, the ſouth of France, and of England. Found chiefly in Somerſetſhire, about Glaſtenbury, flowering in June. This is nearly related to the laſt, but the *ſtems* are taller and more upright. *Leaflets* generally more obtuſe than in *lutea*, though variable, as in that and other *Viciæ*. *Stipulas* always entirely green. Back of the *ſtandard* clothed with yellow ſilky hairs. We preſume not to ſay how far this is really a diſtinct ſpecies, though we have little faith in its being, as the name indicates, a mule production.

36. V. *melanops.* Black-eyed Yellow Vetch. Sm. Prodr. Fl. Græc. Sibth. n. 1711. Fl. Græc. t. 701, unpubl.—Legumes ſolitary, reflexed, linear, ſmooth. Stems diffuſe. Stipulas marked. Wings of the corolla depreſſed, incumbent.—Found by Dr. Sibthorp in Laconia. The *root* ſeems perennial. *Herb* very like the laſt, but rather ſmoother, and the *legumes* differ eſſentially in their long narrow figure, and ſmooth ſurface. *Flowers* of a dull greeniſh-yellow; their *wings*, which converge horizontally, tipped with a very dark brown, almoſt black.

37. V. *pannonica.* Hungarian Yellowiſh Vetch. Jacq. Auſtr. t. 34. Willd. n. 34. Ait. n. 19. (V. ſylveſtris albo flore; Cluſ. Hiſt. v. 2. 235.)—Legumes ſtalked, about three together, hairy as well as the ſtandard. Stipulas marked. Native of meadows in Auſtria and Hungary. Annual. Said to have been cultivated in the Oxford garden, in 1658. We have a ſpecimen from Jacquin's own herbarium, by which this ſpecies appears to be very like *V. hybrida*, eſpecially in its hairy *ſtandard;* but the *flowers* are paler, and grow two or three together. The *calyx* is reddiſh. *Legumes* dark brown when ripe, hairy, and ſhaped like *V. lutea* and *hybrida*. Willdenow ſpeaks of a variety with violet-coloured *flowers*, the *Vicioides uncinata*, Moench. Method. 136, which may be a diſtinct ſpecies, as the colour is not altered by culture. We have no knowledge of any ſuch plant.

38. V. *lævigata.* Smooth-podded Sea Vetch. Fl. Brit. n. 7. Engl. Bot. t. 483. Willd. n. 35. Ait. n. 18. (V. hybrida; Hudſ. 319.)—Legumes ſeſſile, ſolitary, reflexed, ovate, ſmooth. Stems nearly upright. Leaflets elliptical, very ſmooth.—Found on the ſtony ſea-beach at Weymouth, Dorſetſhire, flowering in July and Auguſt. We have never met with a ſpecimen from any other country, yet there is no doubt of the ſpecies being perfectly diſtinct. The *root* is perennial, with many fleſhy knobs. Whole plant entirely ſmooth, eſpecially the *legume*, which differs in that reſpect from *V. lutea*, *hybrida*, and *pannonica*, with all which it agrees in ſhape. The *ſeeds* are rarely more than five. The *ſtems* are from ſix to twelve inches long, much leſs ſpreading than thoſe of *lutea*. *Leaflets* elliptic lanceolate, hardly ever abrupt or emarginate. *Tendrils* branched. *Stipulas* green, or pale brown. *Calyx-teeth* nearly equal. *Flowers* the ſize of *V. lutea*, varying between pale purpliſh-blue and yellow. Both Hudſon and Lightfoot knew this ſpecies well, but could not agree about its ſynonyms.

39. V. *ſordida.* Dingy Vetch. "Waldſt. et Kitaib. Hung." Willd. n. 36.—Legumes nearly ſeſſile, in pairs, reflexed, linear-oblong, reflexed at the point, ſmoothiſh. Leaflets obovate-oblong, emarginate. Stipulas marked.—Native of meadows in Hungary. Communicated by M. Thouin to the writer of this. It flowered in Mr. Mackie's garden, near Norwich, in 1813. The *root* is annual. Plant totally diſtinct from the laſt, notwithſtanding Willdenow's doubts, being larger, with emarginate *leaflets*, ſeldom quite ſmooth: twin *flowers* of a dull or dirty yellow; but particularly a much longer, linear, not ovate, *legume*, which, though not hairy, is ſomewhat roughiſh to the touch, and curved upwards, not downwards, at the point.

40. V. *peregrina.* Broad-podded Vetch. Linn. Sp. Pl. 1038. Willd. n. 37. Ait. n. 20. (V. peregrina, anguſtiſſimis foliis, ſiliquâ latâ glabrâ; Pluk. Phyt. t. 233. f. 6.)—Legumes ſolitary, on ſhort ſtalks, reflexed, ovate, ſmooth. Leaflets linear, very narrow, ſmooth, abrupt, emarginate.—Native of the ſouth of France, from whence Linnæus received ſpecimens in the herbarium of Sauvages. Dr. Sibthorp found it in Caria. M. Thouin ſent ſeeds to Kew garden, in 1779. The plant is annual, flowering in July, of a ſlender ſmooth habit. *Leaflets* extremely narrow in a wild ſtate, with two divaricated terminal points; in a luxuriant cultivated ſpecimen they are rather wider, and more obtuſe, but ſcarcely exceeding an inch in length; they are from ſeven to ten, ſcattered, on a ſtalk ending in a divided tendril. *Flowers* ſtalked, pendulous, of a reddiſh-purple, ſhorter and thicker than ſeveral of the preceding, and more like thoſe of *Orobus tuberoſus*. *Legume* ſhaped like *V. lutea*, *hybrida*, &c. with a deflexed point, but longer, flatter, and quite ſmooth. *Seeds* ſix in our ſpecimens. A very diſtinct ſpecies, little known to modern botaniſts, of which a good figure is wanted.

41. V. *monantha.* Single-flowered Spur-ſtalked Vetch. Retz. Obſ. faſc. 3. 39. Willd. n. 38. Ait. n. 21. (V. calcarata; Desfont. Atlant. v. 2. 166; *Willd now.*)—Stalks much ſhorter than the leaves, ſpurred under the ſolitary flower. Leaflets lanceolate, obtuſe. Stipulas divided. Legumes ſmooth, drooping.—Native of Barbary. A hardy annual, flowering in July and Auguſt. *Herb* ſmooth. *Stem* angular, decumbent, two feet long. *Leaflets* twelve or thirteen, gradually decreaſing, obtuſe with a point. *Flower* the ſize of *V. ſativa*, red with blueiſh veins. *Seeds* ſix or ſeven. *Retzius.* The deſcription of Desfontaines anſwers very well to this, except that he ſpeaks of the *leaves* as ſlightly villous, and of the *flowers* as pale blue, half the ſize of *ſativa*, to which ſpecies nevertheleſs he thinks his plant related; but the *ſtipulas* are not marked.

42. V. *ſepium.* Common Buſh Vetch. Linn. Sp. Pl. 1038. Willd. n. 39. Fl. Brit. n. 8. Engl. Bot. t. 1515. Fl. Dan. t. 699. Rivin. Tetrap. Irr. t. 56. (V. maxima dumetorum; Ger. Em. 1227. Aphace; Fuchſ. Hiſt. 110.)—Stalks about four-flowered, much ſhorter than the upright ſmooth legumes. Leaflets numerous, ovate, obtuſe,

tuse, gradually smaller upwards.—Common in hedges and bushy places throughout Europe, flowering with us in May and June. The *root* is perennial, somewhat creeping. *Stems* about two feet high, weak, but little branched, furrowed, clinging to other plants by the tendrils of their *leaves*. The whole *herb* is clothed with scattered short hairs. *Leaflets* twelve to fifteen, of a dull greyish-green; the lowest an inch in length, the uppermost half as much. *Stipulas* ovate, acute, marked with a brown depression; the lower ones generally half-arrowshaped. *Flowers* crowded, dull purplish-blue, rather short and thick. *Legumes* nearly erect when ripe, linear-lanceolate, an inch and a half long, blackish, minutely dotted, not hairy. *Seeds* about six or eight globular, smooth.

43. V. *bithynica*. Rough-podded Purple Vetch. Linn. Sp. Pl. 1038. Willd. n. 40. Fl. Brit. n. 9. Engl. Bot. t. 1842. Jacq. Hort. Vind. v. 2. t. 147. Allion. Pedem. v. 1. 325. t. 26. f. 2. (Cracca floribus albis, foliis circa caulem denticulatis; Buxb. Cent. 3. 25. t. 45. f. 2.)—Legumes stalked, solitary, erect, rough. Leaflets two pair, elliptic-lanceolate, or nearly linear. Stipulas toothed.—Native of Greece, Italy and Bavaria, in cultivated fields; as well as of bushy places in Yorkshire and Worcestershire, and of fields, or rocky situations, near the coast of Hampshire, Dorsetshire, and Devonshire, flowering from May to July. The *root* is perennial, branching, with many small fleshy knobs. *Stems* angular, trailing or climbing, two feet long, smooth. *Leaflets* from one to two inches long, varying from a line to one-third of an inch in breadth, acute; rather hairy underneath. *Stipulas* large, half-arrowshaped, very deeply, but variously, toothed. *Flower-stalks* various in length, from half an inch to an inch and a half, hairy as well as the long-toothed *calyx*. *Flowers* nearly as large as *V. lutea*, purple, occasionally white. *Legume* oblong-lanceolate, an inch and half long, half an inch broad, reticulated, rough with tawny hairs. *Seeds* five or six, speckled. The *keel* and *wings* of the *flower*, pure white, tipped or tinged with blue or violet, when fresh, turn greenish or brownish twelve hours after gathering.

44. V. *platycarpos*. Flat-podded Vetch. "Roth. Abhandl. 10. t. 1." Willd. n. 41. Ait. n. 24. (Aracus fabaceus, et Faba Kayrina, cui semina minora; Bauh. Hist. v. 2. 286.)—"Legumes solitary, nearly sessile, compressed, somewhat inflated. Leaflets ovate, toothed at the end. Stipulas with fringe-like teeth."—Native of Germany. Annual. Cultivated in Chelsea garden in 1723, flowering in July and August. *Aiton*. *Stem* a foot and half high, thick, angular, hollow, a little hairy. *Leaflets* four, like those of *V. Faba*, hairy, dark green, with a long branching *tendril*. *Stipulas* broad. *Flowers* purple. *Legumes* large, longish, hairy. *Seeds* the size of peas, of a strong disagreeable taste and smell; black when ripe. *Bauhin*.

45. V. *narbonensis*. Broad-leaved Narbonne Vetch. Linn. Sp. Pl. ed. 1. 737. Willd. n. 42. Ait. n. 25. "Roth. Abhandl. 10. t. 2." Rivin. Tetrap. Irr. t. 57. (Faba sylvestris; Matth. Valgr. v. 1. 381. Ger. Em. 1209.)—Legumes about three together, nearly sessile, compressed. Leaflets ovate, obtuse, entire. Stipulas fringed; toothed at the base.—Native of the south of Europe. Annual. The size of the last. *Leaflets* one or two pair, with a divided tendril, obtuse, quite entire, an inch and a half long, one broad, hairy at the rib and margin. *Flowers* solitary; in a cultivated state two or three, dark purple. *Germen* fringed. *Legume* oblong, rather hairy. *Seeds* globose.

46. V. *Faba*. Common Garden Bean. Linn. Sp. Pl. 1039. Willd. n. 43. Ait. n. 26. (Faba; Matth. Valgr. v. 1. 380. Rivin. Tetrap. Irr. t. 23. F. major, hortensis; Ger. Em. 1209.)—Stalks with several flowers, very short. Legumes ascending, tumid, coriaceous. Leaflets elliptical, acute, entire. Tendril abortive. Stipulas half-arrowshaped, toothed at the base.—Native of the borders of Persia, near the Caspian sea, according to Lerche. Commonly cultivated throughout Europe, for the food of men and horses; there being many varieties, differing in the size, roundness or flatness, as well as quality, of the seeds. Annual, flowering in June and July. The *stem* is from three to five feet high. *Leaflets* smooth, larger, more acute at each end, and more alternate than in the two last. *Flowers* from six to ten or more, on a short racemose stalk, deliciously flagrant, white, with a broad black velvet-like spot on each wing. *Calyx* whitish, with ovate taper teeth. *Legume* large, thick, oblong, pulpy within while unripe, containing four or five *seeds*.

The Faba minor sive equina; Bauh. Pin. 338. F. minor; Rivin. Tetrap. Irr. t. 24; is the variety called the Horse Bean, known by its small *pod* and roundish *seeds*. Of this also cultivators observe many subordinate varieties, and perhaps *V. narbonensis* is often confounded among them.

47. V. *serratifolia*. Saw-leaved Vetch. Murr. in Linn. Syst. Veg. ed. 14. 665. Jacq. Austr. append. t. 8. Willd. n. 44. Ait. n. 27. (V. narbonensis; Sm. Prodr. Fl. Græc. Sibth. n. 1715. V. supina, latissimo folio serrato; Tourn. Inst. 397. Aracus fabaceus serratus; Bauh. Hist. v. 2. 287.)—Legumes about three together, nearly sessile, fringed. Leaflets elliptical, obtuse, serrated throughout, as well as the stipulas.—Native of Hungary, Greece, and the island of Cyprus, in moist cultivated ground. A hardy annual with us, flowering in June and July. This is nearly related to the two last, and still more perhaps to *V. platycarpos*; but differs from all in the copious sharp serratures of the *leaflets*, which are usually four pair, with a branched *tendril*. *Stipulas* broad, sharply and copiously toothed. *Flowers* three or four, on a very short stalk, dark purple. *Legume* compressed, with seven or eight globular *seeds*.

We believe the Linnæan synonyms, as here arranged, are correct; and yet Linnæus, like other botanists from time to time, certainly confounded these four last species more or less together. His specimen marked *narbonensis*, from the Upsal garden, answers to the character of *platycarpos*, the *leaflets* being toothed towards the extremity. Hence, in the second edition of Sp. Pl. he altered the specific character, to stipulis*que* denticulatis. But this is not an original specimen, answering to the first edition of Sp. Pl. which latter we take as the most certain authority; and it is in this case consonant with the sentiments of all authors, as above quoted. The plant of the Prodr. Fl. Græc. therefore, by mistake called there *narbonensis*, is really *serratifolia*, with which its synonyms agree. Possibly *platycarpos* may be a variety of *serratifolia*; but for want of an authentic specimen, from some author who has written upon it, we decline any decision upon that point. These two, and the real *narbonensis*, agree in hairiness; the blunt rounded shape of their *leaflets*; the presence of *tendrils*; the dark purple of their *flowers*; and the strong bristly fringe of their *germens* and *legumes*; in all which points they differ from *V. Faba*.

Vicia, in *Gardening*, furnishes plants of the biennial, perennial, and annual hardy kinds, among which the species cultivated are, the common vetch or tare (V. sativa); the Narbonne vetch or tare (V. narbonensis); the many-flowered Siberian vetch (V. biennis); the wood many-flowered vetch (V. sylvatica); the tufted vetch (V. cracca); the Cassubian ligneous vetch (V. cassubica); and the common bean (V. faba.)

The

The first sort does not rise to any great height, but is a plant that varies with common purple flowers; with white flowers. And there is the early summer vetch; the black-seeded vetch; and the white-seeded vetch.

It is the sort which is commonly cultivated in the field for the purpose of green fodder, &c. as well as the production of seed. Sometimes also in pleasure-grounds, &c. as a low climbing plant. See TARE.

The second has long climbing stalks, with dark purple flowers.

The third sort also rises to some height, with numerous light blue flowers coming from the sides of the branches.

The fourth rises with climbing stalks to the height of five or six feet, having many pale blue flowers. It is a twining plant among trees or bushes.

The fifth has the same sort of stalks and flowers.

The sixth sort has lower trailing woody stalks, and pale blue flowers.

The last sort has an annual root, with an upright stalk from two to three or four feet in height in the larger garden varieties.

There are several varieties of garden beans; as the Mazagan bean, which is the first and best sort of early beans at present known. It is brought from a settlement of the Portuguese on the coast of Africa, just without the straits of Gibraltar, and is smaller than those of the horse-bean kind.

The early Portugal or Lisbon bean, which is the next, and appears to be the Mazagan sort saved in Portugal, as it is very like those which are the first year saved in this country. It is the most common sort used by the gardeners for their first crop, but they are not near so well tasted as the real Mazagan.

The small Spanish bean, which comes in soon after the Portugal sort, and is rather a sweeter bean.

And of the small early varieties, there is one which is chiefly planted for curiosity. It is a dwarf, six or ten inches in height, with branches spreading like a fan, and flowers succeeded by small pods, both in clusters; whence it is called the dwarf fan or cluster bean.

Further also of the middle-sized later beans, a sort now very commonly cultivated is the long-podded bean, a yard or more in height, a great bearer, the pods long and narrow, closely filled with oblong middle-sized seeds. Of this there are several sub-varieties, as the early, the tall, the Turkey, &c.

The broad Spanish, which is a little later than the other, but comes in before the common sorts, and is a good bearer.

The white-blossomed bean, which has none of the black mark on the wings. The seed is semi-transparent, and having less of the peculiar bean flavour, when young, than any of the others, is by many in much esteem. It bears abundance of smallish, long, narrow pods, and the seeds are almost black when ripe.

And there is a red-blossomed bean, with smallish pods and seeds, but which is not near so palatable as that with white blossoms.

There are also some other varieties, as the Mumford, the green Venetian, &c.

In the large late kinds, the Sandwich bean, which comes soon after the Spanish, and is almost as large as the Windsor bean, but, being hardier, is commonly sown a month sooner. It is a plentiful bearer, but not very delicate for the table.

The Toker bean, which comes about the same time with the Sandwich, and is a great bearer.

The white and black blossom beans, which are also by some much esteemed; the beans of the former, when boiled, are almost as green as peas; and being a tolerable sweet bean renders it more valuable. These sorts are very apt to degenerate, if their seeds are not saved with great care.

The Windsor bean is allowed to be the best of all the sorts for the table: when these are planted on a good soil, and are allowed sufficient room, their seeds will be very large, and in great plenty; and, when they are gathered young, are the sweetest and best tasted of all the sorts; but these should be carefully saved, by pulling out such of the plants as are not perfectly right, and afterward by sorting out all the good from the bad beans.

This sort of bean is seldom planted before Christmas, because it will not bear the frost so well as many of the other sorts; so it is generally planted for the main crop, to come in in June and July.

Method of Culture in the Vetch Kind.—All the sorts of vetches may be propagated by sowing the seeds in the autumnal or spring seasons, but chiefly in the latter, and mostly where the plants are to remain and grow, as in the large open flower borders, in those of the shrubberies and pleasure-grounds, as well as in the woody walks, wilderness parts, and in the thickets; or in any other place where they are to run and climb up any sort of wood. They should be sown in patches near to shrubs or bushes on which they may climb, and sometimes in the open spaces, to climb upon sticks set for the purpose.

Method of Culture in the Bean Kind.—These crops are raised with much facility by sowing them at different times from October to March, or later. The small sorts are mostly used for the earliest crops, and the first two or three of the above sorts are the most proper for the purpose; but the Mazagan kind is the earliest of all, and most proper to plant for the first crop, and the Portugal and small Spanish bean next, all of which should be planted early on warm south borders, or other sheltered sunny exposures, under or near walls, pales, or hedges, or other warm defended quarters, every month from October till the beginning of February; in order that if the first planting should fail by inclement weather in winter, the others may succeed; and if all the crops should survive the frost, they will succeed one another regularly in bearing. The planting should be performed in rows, ranging south and north, two feet and half asunder, an inch and half deep, and two or three inches apart in each row. They may also be planted in one row lengthways close along under a south wall, &c.

The dwarf bean is not proper to be planted for any general crop, only a few for variety; for which purpose it may be put in in autumn or winter; or in any of the spring or summer months till June or July, in rows two feet asunder, or in patches about the borders.

Of the middle-sized sorts, the long-pods, broad Spanish, and white-blossomed bean are the best for general culture; though some of all the others may be planted occasionally; and the season for these sorts being put in, is for the first crop in November or December, on a broad warm border, or in any of the most sheltered kitchen-garden quarters, in rows two feet and a half or a yard asunder, three inches distance in the row, and two or three inches deep; repeating the planting every month till March, in the open quarters.

Of the large kind, the Sandwich and Toker bean, being generally more plentiful bearers, and of somewhat less succulent growth than the Windsor, are rather hardier to resist the frost, and may be planted earlier, as before Christmas for the first crop; and any time after till May, if required; and of the Windsor, a small or moderate crop may be planted in December, in open mild weather, and a dry soil; in a larger supply in January; and a first full crop in February; and

and thence in full supplies, of these or any of the other larger sort, every three or four weeks, till the end of April, for the main crops; continuing planting them till the end of May, to have successions as long in the season as possible. These should constantly be planted in open exposures, in rows a yard asunder, or three feet and a half for the large Windsor sort; four or five inches asunder in each row, and three deep.

They succeed in any common soil, but where the land is manured for them it is the best.

The general method of planting them is by the dibble, or in drills; for early planting in dry ground, a shallow drill may be first made, then planting the beans in a row along the bottom, allowing from two to four or five inches distance in the row, according to the size or growth of the different varieties, and from one and a half to three inches deep in the small and large beans; and when the plants are come up about three inches high, they should be earthed up on each side of the row with a drawing hoe, keeping them clear from weeds by occasional hoeing in dry weather; and after having advanced nearly to full growth, and in bloom, it is proper to top the plants in general, which throws all the nourishment to the embryo pods, and greatly promotes their setting, and forwards their growth; and in the latter crops prevents their being so much annoyed with the small black fly.

As the use of garden beans is very considerable for some length of time, a pretty large portion of kitchen-garden ground should be allowed for the different crops each year, in order to have a proper succession. They succeed well, as has been seen, in any common soil, but the best where manure is employed, and in free open situations, where they are not injured by the shade or droppings of trees, selecting the driest and warmest places for the early crops, and the strongest moist ground for the late ones.

In gathering the crops, avoid pulling up the stems, especially when the land is moist.

The plants of the vetch kind are, for the most part, introduced for the purpose of variety and ornament in their climbing growth and the curious appearance of the flowers.

VICINAGE, and VICINITUM, a neighbourhood. See VENUE.

VICINAGE, *Common per Cause de.* See COMMON.

VICIOLA, in *Geography*, a river of Naples, which runs into the Trontino, at Teramo.

VICIOSAS, a cluster of small islands, near the coast of Honduras. N. lat. 15° 12′. W. long. 83° 4′.

VICIS *et Venellis Mundandis*, in *Law*, a writ lying against a mayor, bailiff, &c. for not taking care that the streets be well cleansed.

VICISSITUDE, VICISSITUDO, the succeeding of one thing after another. As, the vicissitude of seasons, fortune, &c.

VICK, in *Geography*, a town of Sweden, in West Gothland; 37 miles N. of Uddevalla.

VICKERYVANDY, a town of Hindoostan, in the Carnatic; 18 miles W.N.W. of Pondicherry.

VICO, ENEA, in *Biography*, a native of Parma in the 16th century, was one of the first persons who illustrated the medallic science. By profession he was an engraver of copper; and at his death in Ferrara, among other remains, he left copper-plates of all the coins in Europe, with their weight, standard, and value. See ITALIAN *School of Engraving*.

VICO, in *Geography*, a town of Naples, in Principato Citra, the see of a bishop, suffragan of Sorento; near the sea. Its situation is delightful, on the brow of a hill, backed by an amphitheatre of mountains. The strata of these eminences incline contraryways to one centrical point, as if there had originally existed a similar mass in the centre, torn asunder and swallowed up by one of those shocks which must have often overturned this unstable country. Charles II. and Joan I. raised Vico out of obscurity, on account of the charms of its situation. In 1694, it was almost destroyed by an earthquake; 3 miles E.N.E. of Sorento.—Also, a town of Naples, in Capitanata; 10 miles W. of Vieste.—Also, a town of Corsica, in which is the cathedral of the bishop of Sagona; 30 miles S. of Calvi. N. lat. 43° 3′. E. long. 8° 56′.—Also, a village of Dalmatia, near the river Norin, in a marshy spot, where the ancient Narona once stood. The inhabitants, who go often to cut reeds in the marsh, say that the vestiges of that large city may still be seen under water. It must have been extended over the plain a great way, and undoubtedly above three miles in length, at the foot of the hills. The ancient roads are now under water, and the present passage over a very steep and craggy hill, on which, probably before the Roman times, the fortifications were erected. Along the path are to be seen traces of ancient inscriptions on the rock. A poor hamlet now occupies the spot where temples and palaces of the conquering Romans once stood; and grand vestiges still remain of baths, aqueducts, walls, and noble edifices; even the wretched cottages of the Morlack inhabitants are all built of fine ancient hewn stone; 5 miles N.W. of Citluc.

VICO *di Pantano*, a town of Naples, in Lavora; 12 miles S.W. of Capua.

VICOMAGISTER, among the *Romans*, an officer whose business it was to take care of the streets, that nothing might obstruct, or render them any wise incommodious.

VICONTIEL. See VICOUNTIEL.

VICOVARO, in *Geography*, a town of the Popedom, in the Sabina, on the Teveroni; 20 miles E.N.E. of Rome.

VICOUNT, VICE-COMES, in our *Law-Books*, signifies the same with sheriff; between which two words there seems to be no other difference, but that the one came from our conquerors, the Normans; and the other from our ancestors, the Saxons.

VICOUNT, or *Viscount*, is also used for a degree of nobility, next below a count or earl, and above a baron.

Camden observes, that this is an ancient name or office, but a new one of dignity never heard of among us till Henry VIth's days, who, in his eighteenth year, created, in parliament, John lord Beaumont, *vicount Beaumont*: but it is much more ancient in other countries.

Du-Cange, indeed, will have the dignity to have had its first rise in England; but it is much more probable it was first brought over hither by the Normans.

The privileges of a viscount are, that he may have a cover of assay held under his cup when he drinks, and may have a travers in his own house. And a viscountess may have her gown borne up by a man, out of the presence of her superiors; and, in their presence, by a woman.

VICOUNTIELS, VICONTIELS, *Vicecomitalia*, in our *Law-Books*, denote things belonging to the sheriff; particularly certain farms, for which the sheriff pays a rent to the king, and makes what profits he can of them.

VICOUNTIEL, *Writs*, are such as are triable in the county or sheriff's court, and which are not returned to any superior court, till finally executed by him. Of which kind are divers writs of nuisance, the writ of ADMEASUREMENT *of Pasture*, &c. which see.

VICOUNTIEL or *Vicontiel Jurisdiction*, is that jurisdiction belonging

belonging to the officers of a county; as sheriffs, coroners, escheators, &c.

VICQ, in *Geography*. See Vic and Viq.

VICQ-D'AZYR, Felix, in *Biography*, was born at Valognes, in Normandy, in 1748, and distinguished himself both as a physician and a man of letters. Settling at Paris in 1765, he pursued with diligence every branch of study connected with medicine, and paid particular attention to the physiological part of anatomy. In 1773 he commenced a course of lectures on human and comparative anatomy, in which pursuit he was very popular; but he was interrupted by a spitting of blood, which made it necessary for him to return to his native place. Here he applied to the anatomical examination of fishes, the result of which he communicated to the Academy of Sciences, which associated him as a member. When a murrain appeared among the cattle in Languedoc in 1775, Vicq-d'Azyr was commissioned by the minister Turgot to discover means for restraining it, which charge he executed with success. A medical society was formed at Paris about this time, which he zealously promoted, and of which he was secretary. He also, in connection with this society, performed the office of eulogist, very much to his own reputation, and to the honour of many considerable persons, whose talents and services he commemorated. In his private character he exhibited, with gentle manners, a very considerable degree of ardour and sensibility; so that he is represented as a warm friend and philanthropical citizen. He obtained both fame and fortune, employing the latter liberally in collecting a costly apparatus and a well-chosen library. Agitated and exhausted by the disastrous effects of the revolution, he died in June 1794, at the age of forty-six. His "Eloges Historiques" were collected and published, with notes, and a memoir on the author, by J. L. Moreau, three vols. 8vo. 1805. His other writings were communicated to the Memoirs of the Academy of Sciences and of the Medical Society. Nouv. Dict. Hist.

VICTIM, Victima, so called, either because *vincta percussa cadebat*, or because *vincta ad aras ducebatur*, a bloody sacrifice, offered to some deity, of a living thing; either a human person, or a beast, which is slain to appease his wrath, or to obtain some favour. See Sacrifice.

It is not certain who was the first person that introduced bloody sacrifices among the Pagans. If the authority of Ovid be at all regarded, he alleges that the sow was the first animated victim which was offered to Ceres, on account of the ravages which that animal makes in the field. (Fast. l. i.) From Homer we learn, that the use of such sacrifices was common in the time of the Trojan war. Whenever they were introduced, it is certain that they were very ancient in the Pagan world. It may be observed, however, that when victims of this kind were offered, they blended with them herbs, salt and meal. Pliny informs us, that Numa prohibited the Romans from using bloody victims, or any other sacrifice, besides those in which they employed fruits, salt, and corn. Dion. Halic. ascribes this prohibition to Romulus; and he adds, that this usage subsisted in his time, although they had superadded to it that of bloody sacrifices. At length, however, superstition prevailed to such a degree, that they offered to their deities human victims; and this barbarous custom, the origin of which is not satisfactorily ascertained, was propagated to almost every known nation. These horrid sacrifices, prescribed even by the oracles of the gods, were known in the days of Moses, and constituted a part of those abominations with which this legislator reproached the Amorites. The Moabites sacrificed their children to Moloch, and burned them in the cavity of the statue of that god. According to Dionysius of Halicarnassus, they offered men in sacrifice to Saturn, not only at Tyre and Carthage, but even in Greece and Italy. The Gauls, if we may believe Diodorus Siculus, sacrificed to their gods their prisoners of war; those of Tauris, all the strangers who landed upon their coasts: the inhabitants of Pella sacrificed a man to Peleus. Those of Temessa, as Pausanias has it, offered every year a young virgin to the Genius of one of Ulysses' associates, whom they had stoned; and Aristomenes, the Messenian, sacrificed three hundred men at one time. Strabo mentions those abominable sacrifices offered by the ancient Germans. Athanasius gives the same account of the Phœnicians and Cretans; and Tertullian of the Scythians and Africans. In the Iliad of Homer we see twelve Trojans sacrificed by Achilles to the manes of Patroclus. In fine, Porphyry gives a long detail of all the places where, in old times, they offered up human sacrifices; among which he enumerates Rhodes, the island of Cyprus, Arabia, Athens, &c.

From all these testimonies put together, and from several others, which it is needless to quote, it follows, that the Phœnicians, the Egyptians, Arabians, Canaanites, the inhabitants of Tyre and Carthage, those of Athens and Lacedæmon, the Ionians, all Greece, the Romans and Scythians, the Albanians, the Allemans, the Angles, the Spaniards, and the Gauls, were equally guilty of this horrid superstition.

For the public sacrifices there were authorized ministers or priests who made a choice of victims; and several names were given to these victims from some circumstances that attended the oblations. Such as were offered up the day before the solemnity, were called "præcidaneæ hostiæ;" as the sow, sacrificed to Ceres before harvest, was called "præcidanea porca." Again, they gave the name of "succedaneæ hostiæ" to such sacrifices as they offered up, when the former ones had been neglected; and thus it was they atoned for the omission. There were others named "eximiæ hostiæ;" meaning not that these victims had any peculiar excellence, as the word properly signifies, but that they were separated from the flock in order to be sacrificed, "eximebantur grege." The ewes that had two lambs, which they sacrificed with the mother, were termed "ambiguæ oves," and the victims whose entrails were adherent, "harungæ" or "harugæ;" such as were consumed, "prodigiæ;" and such as had two teeth higher than the rest, "bidentes."

Of whatever nature the victims were, great care was to be taken in the choice of them; and the same blemishes, that excluded them from sacrifices among the Jews, rendered them also imperfect among the Pagans; whence it would seem that they borrowed several rites from the Hebrews.

All sorts of victims were not offered indiscriminately to every divinity, or for every purpose. It was commonly a sow, big with young, that they offered to Cybele and to the goddess Tellus; the bull to Jupiter; to Juno, heifers, ewe-lambs, sheep; and at Corinth they sacrificed to her a she-goat. To Neptune, a bull and lambs, as appears from Homer; to Pluto, likewise, a bull; and to Proserpine a cow, both of them black: and when that goddess was taken for Hecate, they sacrificed to her a dog, an animal whose barking they thought drove away the apparitions sent by that goddess. The most acceptable victims to Ceres, were the boar and the sow: they made her likewise an offering of honey and of milk. To Venus the dove, the he-goat, the heifer, a white she-goat, &c.: to Bacchus, a he-goat. They sacrificed the cow and the bull to Hermione, as we learn from Ælian, who adds, that in these sacrifices, a bull, which

ten men had much ado to master, of his own accord followed an old priestess to the altar. To the Sun sometimes honey; but the Armenians and Massagetes sacrificed to him horses. To Apollo (for frequently he was distinguished from the Sun) they offered the ram, the she-goat, the ewe, and the he-goat; and when they confounded him with the Sun, a young bullock, with gilded horns, as an emblem of his beams: they offered to him likewise a raven. To Mars, the horse, the bull, the boar, and the ram. The Lusitanians sacrificed to him he-goats, she-goats, and sometimes their enemies; the Scythians offered to him asses; and the Carians, dogs. We learn from Homer, that the victims most grateful to Minerva were the bull and the lamb; or, according to Fulgentius Planciades, oxen which had never known the yoke. To Diana, stags, she-goats, more especially among the Athenians; and, in some places, cows. To the Dii Lares, a bullock, or an ewe-lamb, according to the ability of those who offered. To them they also sacrificed cocks and swallows, and the hog, whence they got the name of Grundiles.

In fine, every god had his favourite animal, tree, or plant. Among the animal kind, the lion was consecrated to Vulcan; the wolf to Apollo and Mars; the dog to the Lares and to Mars; the dragon to Bacchus and Minerva; the griffins to Apollo; the serpents to Esculapius; the stag to Hercules; the lamb to Juno; the horse to Mars; the heifer to Isis. Among the birds, the eagle was sacred to Jupiter: the peacock to Juno; the owl to Minerva; the vulture and the wood-pecker to Mars; the cock likewise to Mars, to Esculapius, Apollo, and Minerva; the dove and sparrow to Venus; the king's-fisher to Tethys; the phœnix to the Sun; and the cicada, a sort of flying insect, to Apollo. Among the fishes, which belonged all to Neptune, the concha marina, and the small fish named apua, which Festus says is produced by the rain, were acceptable to Venus, and the barbel to Diana. Among the trees and plants, the pine was consecrated to Cybele, for the sake of Atys; the beech to Jupiter; the oak, and its different species, to Rhea; the olive to Minerva; the laurel to Apollo, from his amour with Daphne; and the reed to Pan, from the story of Syrinx: the lotos and the myrtle were likewise consecrated to Apollo and Venus; the cypress to Pluto; the narcissus and the maiden-hair, termed likewise capilli veneris, to Proserpine; the ash-tree and dog's-grass to Mars; purslane to Mercury; the myrtle and the poppy to Ceres; the vine, and its leaves, to Bacchus; the poplar to Hercules; dittany and the poppy to Lucina; garlick to the Dii Penates; the alder-tree, the cedar, the narcissus, and the juniper-tree, to the Furies; the palm to the Muses; the plane-tree to the Genii; the alder to the god Sylvanus; the pine to Pan, &c. The Greeks offered Iphigenia, at Aulis, for a victim to obtain a favourable wind.

As there were different sorts of victims, the mode of offering them was also different. Some were wholly burnt, and others consumed only in part: and it belonged to the diviners among the Greeks, and to the aruspices among the Romans, to order the time, form, and manner of the sacrifices. We may further remark with Lucian, that the sacrifices differed according to the quality of the persons. "The husbandman," says he, "offers up an ox; the shepherd, a lamb; the goat-herd, a goat: there are some who make only a simple offering of cakes or incense; and he that has nothing, makes his sacrifice by kissing his right hand."

Artificial or *factitious* victim, denotes a victim made of baked pastes in the form of an animal, which was offered to the gods, when they had no natural victims or no opportunity of offering them. Thus, according to Porphyry, Pythagoras offered a sacrifice of an ox in paste; Empedocles is also said by Athenæus to have done the same. Pythagoras derived the practice from Egypt, where it was very ancient, and where it was used in the time of Herodotus.

VICTIMARIUS, a minister, or servant of the priest, whose office was to bind the victims, and prepare the water, knife, cake, and other things, necessary for the sacrifice. See SACRIFICE.

To the victimarii it also belonged to knock down, and kill, the victims: in order to which, they stood close by the altar, naked to the waist, but crowned with laurel; and holding a hatchet or a knife up, asked the priest leave to strike; saying, *Agone? Shall I strike?* Whence they were called *agones*, and *cultellarii*, or *cultrarii*.

When the victim was killed, they opened it; and, after viewing the entrails, took them away, washed the carcase, and sprinkled the flour on it, &c.

The same victimarii also lighted the fire in which books were condemned to be burnt. See Liv. lib. xl. cap. 29. and A. Gellius, lib. i. cap. 1. extr. 12.

VICTOIRE, or *Woody Island*, in *Geography*, a small island in the Chinese sea. N. lat. 1° 33′. E. long. 106° 18′.

VICTOPHALI, or VICTOBALI, in *Ancient Geography*, a people of Dacia, according to Eutropius and Ammianus Marcellinus. This country was subjugated by Trajan.

VICTOR I., pope, in *Biography*, succeeded Eleutherius in 192. During his pontificate several circumstances occurred which render it difficult to maintain his infallibility. He first appeased and afterwards anathematized the heretical doctrine taught at Rome by Theodotus of Byzantium concerning the person of Christ. He also recognized a prophetic spirit in Montanus; and gave to two of his female followers, Prisca and Maximilla, letters of peace to the churches of Asia and Phrygia, which he afterwards revoked. As his infallibility was impeached, his pontifical authority was also vigorously opposed in the controversy between the Eastern and Western churches concerning the celebration of Easter. The former had been accustomed to observe the rule established for the Jewish paschal, whereas the latter disapproved the observance of Easter on any day except Sunday, and they had, accordingly, adopted a different method of computation. The dispute was of no great importance, and had occasioned no discord and separation between these churches. But Victor arrogantly interposed, and enjoined the Asiatic prelates to observe the custom that prevailed among the Western Christians. These prelates resisted his mandate, and Victor menaced Polycrates, bishop of Ephesus, who took the lead on this occasion, with exclusion from his communion. The prelate convened a council of all the bishops of Asia Minor, and they were unanimous in their resolution not to abandon the ancient practice. The pope was exasperated, and declared the Asiatic prelates unworthy of the title of brethren, and excluded them from all fellowship with the church of Rome. But his violence was disapproved, and he was regarded as a disturber of the peace and union that subsisted among Christians. Irenæus, bishop of Lyons, remonstrated against his conduct in a letter written to him with a spirit of wisdom and moderation: and the Asiatics retained their custom till the Western practice was authoritatively established by the council of Nice. These proceedings sufficiently shew that the supremacy of the see of Rome was not acknowledged at this period. Victor, after a pontificate of ten years, closed his life towards the end

end of the year 201, or the beginning of 202. None of his writings are extant, though, according to St. Jerom, he was the first ecclesiastical author who used the Latin language. His zeal for the church has caused him to be enrolled among the saints of the Roman calendar. Dupin. Bower.

VICTOR II., pope, was the successor of pope Leo IX., and elevated to the papal chair by the influence of Hildebrand, afterwards pope Gregory VII., and by the special appointment of Henry III., emperor of Germany. The person chosen was Gebehard, bishop of Eichstat, a relation of the emperor, who against his own inclination was consecrated in April 1055, and assumed the name of *Victor*. Soon after his promotion he held a general council at Florence, for the correction of various abuses, and the condemnation of Berengarius's doctrine concerning the Eucharist. Hildebrand maintained his influence during this pontificate, and availed himself of an opportunity that offered for extending the civil authority of the papal see. This was the recognition of Henry III. as the only true emperor, against the claims of Ferdinand, king of Castile and Leon. The pope's requisition, though at first vigorously opposed in Spain, ultimately prevailed. In 1056 a council was held at Toulouse, which passed several canons against simony, and the incontinence of the clergy. Whilst this council was sitting, Victor was summoned by a special message from the emperor Henry to attend him in his last moments. The pope, in compliance with his dying intreaty, recognized his son, Henry IV., for his successor in the empire. After his return to Italy he held a council at Rome, and then retired to Tuscany, where he died in July 1057. A single letter of this pope remains: and superstition has recorded some miracles that were wrought during his pontificate. Dupin. Bower.

VICTOR III., pope, one of three persons named by Gregory VII. in 1085, when he was dying, and recommended to the cardinals as his successor. The person chosen was Desiderius, abbot of Monte Cassino, descended from the family of the dukes of Benevento, and born about 1027. He had embraced a monastic life in 1050, and was chosen abbot of Monte Cassino in 1058, and in the following year created cardinal. It was with great reluctance that he consented, in 1086, to accept the pontificate, and as soon as the attendant ceremonies were completed, he withdrew to his monastery. In the following year a council was held at Capua, which constrained him to accept the popedom in March 1087, and he was solemnly consecrated in the church of St. Peter by the name of Victor III. His election was contested by the antipope Guibert and his adherents; but he was zealously supported by the countess Matilda, who by force of arms established him at Rome, though he was not long after obliged to withdraw to Monte Cassino. Here he engaged the Italian princes to form a league against the African Saracens. Soon afterwards he summoned a council at Benevento, at which Guibert was anathematized, and the decrees of Gregory against lay investitures and simony were renewed. During the session of this council he was taken ill, and after recommending Otho, bishop of Ostia, for his successor, he retired to Monte Cassino, and died in September 1087. Whilst he was abbot he wrote four books of dialogues on the miracles of St. Benedict, and the other monks of Monte Cassino, three of which are published in Mabillon's "Acta Sanctorum." Dupin. Bower.

VICTOR-AMADEUS II., duke of Savoy, and first king of Sardinia, was born in 1666, and succeeded his father, Charles-Emanuel II., in 1675. In 1684 he married Anna-Maria of Orleans, daughter to the duke of Orleans, brother of Lewis XIV., by Henrietta-Anne of England, which marriage would have conveyed to the house of Savoy the next hereditary right to the British throne, after the house of Stuart, if it had not been set aside by its profession of the Roman Catholic religion. The first military transaction of this prince, which is not very honourable to his memory, was the expulsion, by much slaughter, of his Protestant subjects of the Vaudois. In 1687, however, he joined the grand alliance against France, in which treaty the restoration of the Vaudois was a secret article. Voltaire characterizes him as a wise, politic, courageous prince, understanding the art of war, and practising military discipline; but chargeable with faults, both as a sovereign and as a general. In the first war against France he was a severe sufferer; but in 1696 a treaty was concluded, by which all the places he had lost were restored, and a sum of money was granted to him by way of indemnification; and a contract of marriage was settled between his eldest daughter and the duke of Burgundy, heir apparent to the crown of France. The duke of Savoy then joined his troops to those of his new ally, and he soon after became generalissimo of Lewis XIV. Soon after these events, another connection was formed between the house of Bourbon and the duke of Savoy, by the marriage of Philip, duke of Anjou, grandson of Lewis XIV. called to the throne of Spain, to the duke's second daughter: and thus he had the rare fortune of seeing the two principal kingdoms of Europe occupied by his immediate descendants. Nevertheless, at the commencement of the succession-war, in 1702, the duke abandoned the interest of these courts, and entered into secret negociations with the allied powers. The French court, having found that he had signed a treaty with the emperor, adopted hostile measures, and took from him a number of towns, and in 1706 laid siege to his capital, Turin, which he bravely resisted, until he was effectually succoured by prince Eugene, who attacked the French in their trenches, and raised the siege. The duke, having recovered the towns which he had lost, assisted the Imperialists in driving the French from Lombardy. The duke afterwards had some disagreement with the emperor, and remained inactive till the treaty of Utrecht, in 1713. In this general pacification, such was the high estimation in which he was held by all parties, that he was restored to the possession of the duchy of Savoy, the county of Nice, and all their dependencies. The king of France yielded to him two strong fortresses, and several valleys among the mountains; and the ridge of the Alps was made the boundary between France on one side, and Piedmont and Nice on the other. The emperor confirmed to him that part of Montserrat which had belonged to Mantua, with several provinces and territories in Italy; and his Catholic majesty resigned to him the kingdom of Sicily, which gave his house the royal title; and it was moreover agreed, that in default of heirs to the king of Spain, that crown should pass to the house of Savoy, in preference to that of Bourbon. Victor-Amadeus and his spouse were crowned at Palermo, in the close of that year, and the Spaniards evacuated Sicily: but some differences occurring between him and the court of Spain, it was required that he should send his eldest son to Spain, as a kind of hostage. Upon his non-compliance with this requisition, Alberoni, the prime minister of Spain, made preparations for conquering Sicily from Victor, and Sardinia from the emperor. France and England interposed in the dispute; and it was finally determined, that Victor should resign Sicily,

Sicily, and as an indemnity receive Sardinia, with the royal title annexed to it, which meaſure was accompliſhed in 1718, and the dukes of Savoy have thenceforth ranked among the monarchs of Europe as kings of Sardinia.

Victor-Amadeus from this time devoted himſelf to the arts of peace; and after a reign of fifteen years, as duke and as king, abdicated his titles and government, in 1730, in favour of his ſon, Charles-Emanuel, contenting himſelf with an annual penſion. But afterwards repenting of his conduct, and inſtigated by an ambitious miſtreſs, to whom he was privately married, he attempted to reſume his royalty. The new king reſiſted his inclinations, and placed him under a degree of reſtraint, in which ſtate he died, at the caſtle of Rivoli, near Turin, in 1732, in his 67th year. Mod. Un. Hiſt. Gen. Biog.

Victor, Aurelius. See Aurelius.

Victor, in *Geography*, a town of Peru, in the juriſdiction of Arequipa; 15 miles S. of Arequipa.

VICTORIA, Vicente, in *Biography*, was a Spaniſh artiſt, a native of Valencia, and born in 1658. He went to Rome when young, and there became a ſcholar of Carlo Maratti, and diſtinguiſhed himſelf ſufficiently in hiſtorical painting to be taken into employment by the grand duke of Tuſcany. His portrait is in the Florentine gallery. He painted ſeveral pictures for churches in his native country, and died at Rome in 1712.

Victoria, *Maſcar*, in *Ancient Geography*, a town of Africa, in the interior of Mauritania Cæſarienſis, S.E. of Arſinaria: mentioned by Ptolemy.

Victoria, a town of ancient Britain, belonging to the Damnii, which Camden ſuppoſes may be the ancient Britiſh town mentioned by Bede, called Caer-Guidi, and ſituated in Inch-Keith, a ſmall iſland in the Firth of Forth. Baxter earneſtly contends for Ardoah, in Strathearn, while Horſley prefers Abernethy. Its ſituation cannot be aſcertained.

Victoria, in *Geography*, a town on the ſouth-weſt coaſt of the iſland of Amboyna, ſituated in a large bay. N. lat. 3° 42′. E. long. 128° 23′.—Alſo, a ſmall iſland in the Atlantic, near the coaſt of Braſil. S. lat. 23° 40′.—Alſo, a town of South America, in the province of Caraccas; ſix leagues E. from Tulmero, and on the road that leads to the city of Caraccas. It was founded by the miſſionaries, and compoſed ſolely of Indians, until induſtry fixed her ſeat in the valleys of Aragoa, and drew thither a number of whites, of whom part ſettled at Victoria. The lands in its vicinity were cultivated, and their produce placed decent houſes in the room of Indian huts. A very handſome church, vying in beauty and ſize with the principal cathedrals in America, has lately been erected in this place, and the number of inhabitants of all colours is reckoned to amount to 7800.

VICTORIÆ Mons, in *Ancient Geography*, a mountain of Hiſpania Citerior, near the river Hebrus.

Victoriæ *Julio Brigenſium Portus*, a port and town of Hiſpania Citerior, belonging to the Varduli.

VICTORIAN Period, in *Chronology*. See Period.

VICTORIATUS, among the *Romans*, a coin with Victory repreſented on one ſide, equal in value to half the denarius.

VICTORINUS, Caius, or Fabius Marius, in *Biography*, an African philoſopher, was a convert to Chriſtianity, and flouriſhed in the fourth century. He gained ſuch a degree of reputation by teaching rhetoric at Rome, that a ſtatue was erected in honour of him in one of the public places. He was led to the peruſal of the Scriptures by the ſtudy of Plato's works, and thus convinced of their truth, after ſome heſitation, he publicly declared himſelf a Chriſtian, and was baptized in the preſence of all the people. He was the author of ſeveral works, ſome of which are publiſhed in the Bibliotheca Patrum; but as they are of no great value, it is needleſs to enumerate them. The time of his death, though not preciſely aſcertained, is ſuppoſed to have been previous to the year 386. Dupin.

VICTORIOLA, in *Botany*, a name uſed by ſome authors for the hippogloſſum, called in Engliſh the *Alexandria-laurel, horſe-tongue*, or *double-tongue*.

VICTORIUS, in *Biography*. See Vettori.

VICTORY, Victoria, the overthrow, or defeat, of an enemy, in war, combat, duel, or the like. See War, Combat, Duel, Champion, &c.

Among the Romans, crowns, triumphs, &c. were decreed to their generals, for the victories they gained.

Victory, *Actian*, denotes the victory which Auguſtus, or rather his general, gained over Mark Antony after the capture of Actium; in commemoration of which he built the city of Nicopolis, and re-eſtabliſhed with peculiar magnificence the Actian games.

Victory, *Games of*, were public games celebrated on account of a victory; they were called by the Greeks επινικιοι αγωνες, and in Latin inſcriptions they are denominated *ludi victoriæ*. Of theſe, the Roman hiſtory recites thoſe in honour of Auguſtus, after the battle of Actium; thoſe of Septimius Severus, after the defeat of Peſcennius Niger; thoſe in honour of Lucius Verus and Marcus Aurelius, on their return from the expedition againſt the Parthians, recorded on the marble of Cyzicus, &c.

Victory, in *Mythology*, called Νικη by the Greeks, was perſonified and made a deity both by the Greeks and Romans. According to Varro, ſhe was the daughter of Cœlum and Terra; but Heſiod makes her the daughter of Styx and Pallas. Temples, ſtatues, and altars were conſecrated to this deity. Sylla, according to Cicero, inſtituted games in honour of this goddeſs. At Athens there was a temple dedicated to Victory, in which was placed her ſtatue without wings. The firſt temple built in honour of her by the Romans was during the Samnite war, under the conſulate of L. Poſthumius and M. Attilius Regulus. With them ſhe was repreſented as a winged deity, ſometimes almoſt in the attitude of flying, and with her robe carried back with the wind; holding a laurel crown in her hand, which was anciently the peculiar reward of ſucceſsful generals and great conquerors. The Egyptians repreſented her under the figure of an eagle, a bird always victorious in its combats with other birds. The poets inform us that her wings were white, and her robe of the ſame colour. They ſometimes deſcribe her hovering between two armies engaged in battle, as doubtful which ſide ſhe ſhall chooſe, and ſometimes ſtanding fixed by one ſhe is reſolved to favour, as ſhe is often ſeen on the medals of the Roman emperors. This goddeſs is often repreſented in a chariot, drawn rapidly along by two horſes. Pliny ſpeaks of a picture of Victory in Rome, in which ſhe was aſcending to heaven, in a chariot with four horſes, as ſhe appears on the Antonine pillar, carrying thither ſome hero, and with a palm-branch in her hand. This, and the crown of laurel, were her general attributes; and a third was a trophy, and ſometimes two, one on each ſide of her. Sometimes ſhe is ſeen mounted on a globe, as ſhe appears upon the medals of the emperors, becauſe they reckoned themſelves maſters of the world. When a naval battle was deſigned, ſhe was drawn mounted on the prow of a ſhip; and when ſhe holds a bull by the muzzle, it points out the ſacrifices that were offered after any advantages that were gained. It appears from the ancients that no bloody

victim

victim was offered to her, but that her sacrifices were the fruits of the earth. She was called by various names; by the Egyptians, Nepthe; by the Sabines, Vacuna; by the Greeks, Apteros, without wings; by others, Vitula. Among her epithets were Eteralcea, which Homer uses to denote that she inclined to both sides; that of Præpes and Volacris, to denote her swiftness; and that of Cœligena by Varro, because Victory comes from heaven. A Victory at Rome, whose wings were burnt by lightning, gave rise to the following epigram: "Rome, great queen of the world, thy glory shall never fade, since Victory, now stripped of her wings, can never fly away."

Victory, in *Geography*, a town of America, in the district of Vermont, and county of Essex, containing six inhabitants; 75 miles N. of Norwich.

Victory, *Cape*, the extreme N.W. point of the Straits of Magellan, at the opening to the South Pacific ocean. S. lat. 52° 15′. W. long. 76° 40′.

VICTUALLER, one that sells victuals; and we now call all common alehouse-keepers victuallers. See Alehouse.

Victuallers shall sell their victuals at reasonable prices, or forfeit double value; and victuallers, fishmongers, poulterers, &c. coming with their victuals to London, shall be under the regulation of the lord-mayor and aldermen; and sell their victuals at prices appointed by justices, &c. (23 & 31 Edw. III. c. 6. 7 Rich. II. 13 Rich. II.) If any victuallers, butchers, brewers, poulterers, cooks, &c. conspire and agree together not to sell their victuals, but at certain prices, they shall forfeit for the first offence 10*l.*, for the second 20*l.*, and for the third offence 40*l.* (2 & 3 Edw. VI. c. 15.) See Forestalling.

Victualler, *Agent*. See Agent.

VICTUALLING-Office, an office formerly kept on Tower-Hill, now in Somerset-House and Deptford, for furnishing his majesty's navy with victuals.

It is managed by seven commissioners, who have their inferior officers, as secretaries, clerk, &c.; besides agents in divers parts of Great Britain, Ireland, &c.

VICTUS Ratio, among *Physicians*, a particular manner of living, for the preservation of health, and prevention of diseases.

VICUNNA, in *Zoology*, a name given to the *pacos*.

VICUS Aquarius, in *Ancient Geography*, a very considerable town of Hispania, in Lusitania, towards the north, in the country of the Vettones.

Vicus *Augusti*, *Kair-Wan*, a town of Africa, on a large plain, S. of Adrumetum, marked in the Itin. of Antonine between Aquilianæ and Cloacaria.—Also, a town of Africa Propria, upon the route from Carthage to Sufetula, between Adrumetum and Aquæ Regiæ. Anton. Itin.

Vicus *Badius*, a place of Italy, on the route from Rome to Adria, between Palacrinum and Centesimum. Anton. Itin.

Vicus *Cuminarius*, a place of Hispania Citerior, belonging to the Carpentani, at a small distance upon the left of the Tagus. It is marked in the Itin. Anton. on the route from Emerita to Cæsar-Augusta, between Alces and Titulciæ.

Vicus *Judæorum*, a place of Egypt, on the other side of the Nile, between Thou and Scenæ Veteranorum, according to the Itin. of Antonine.

Vicus *Novus*, *Vico*, a small place of Italy, in Campania, at some distance to the S.E. from Calatia and Capua.—Also, a place of Italy, in Umbria, on the route from Rome to Adria, between Eretum and Reate. Anton. Itin.

VID, in *Geography*, a river of Bulgaria, which runs into the Danube, 10 miles W. of Nicopoli.

VIDA, Marco-Girolamo, in *Biography*, a modern Latin poet of reputation, was born at Cremona of parents nobly descended, but in humble condition. The date of his nativity is differently assigned; some fixing it in the year 1470, and others in 1490. His education was liberal at Padua and Bologna, in the latter of which cities two of his poems were published in 1504, under the name of Marc-Antonio, which he changed for Marco-Girolamo, when he took orders as a canon regular of Lateran. For assistance in the study of theology and philosophy, to which in early life he was devoted, he went to Rome in the latter years of Julius II. His poems were much applauded, and gave him rank among the principal geniuses of the age. He was indebted to the early patronage of Ghiberti, bishop of Verona, for an introduction to Leo X., who bestowed upon him both wealth and honours. Besides other benefices, he presented him to the priory of St. Silvestro, in Frascati, where he enjoyed a favourable opportunity for pursuing his studies, and especially the completion of his "Christiad," in which Leo had engaged him. Of his more considerable poems, his work entitled "De Arte Poetica" is supposed to have been first written; and the first known edition of it is dated in 1527. This was soon followed by his "Bombyx," or art of rearing silk-worms, and his "Scacchiæ Ludus," or poem on the game of chess. Clement VII. became his second patron, and promoted him first to the office of apostolical prothonotary, and in 1532 to the bishopric of Alba. After the death of this pope, he retired to his diocese, and established the character of a zealous and affectionate pastor; and when, in 1542, Alba was invested by the French, he contributed by his exhortations and example so to animate the citizens, as to preserve it from the enemy. His two books "De Republica" contain dialogues, which are the substance of a conversation that passed between him, and some cardinals and learned men, at the council of Trent. These dialogues are excellent, with respect to the correctness and elegance of their style, and evince that the author was no less extensively conversant with politics and philosophy than with polite literature. In 1551 Vida retired to Cremona, on account of the wars which desolated his diocese: however, he was not unmindful of his pastoral charge, but effectually interceded with Don Ferdinand Gonzaga, governor of Milan, and thus prevented his marching, as he threatened to do, to Alba, and putting all the inhabitants to the sword. In 1563 he was still at Cremona, but soon after removed to Alba, and died there in 1566. As a Latin poet, Vida acquired a very high reputation; to which he was justly entitled, partly on account of the subjects which he selected, and partly for the singular classic purity and dignity of his style, formed on the model of the most admired productions of antiquity. Virgil was the object of his admiration and imitation, whom he respected, and after whom he copied, as Cicero was the model of the prose Latin writers of that age. "Vida's works," says a judicious biographer, "do not so much give the impression of a writer of original and fervid genius, as of one possessing taste, elegance, and ingenuity." Besides the poems already mentioned, Vida was the author of Eclogues, of Sacred Hymns, and of other small pieces, which are marked with his purity of diction and classical refinement. The fame of this poet in England has been greatly promoted by the well-known lines in Pope's Essay on Criticism, which place him on a parallel with Raphael, and entitle Cremona to boast of him, as much as Mantua of Virgil; but this was the hyperbolical eulogy of a juvenile writer, which his maturer judgment would scarcely

have confirmed. The candid Tiraboschi is contented with saying of him, that his qualities, if not sufficient to rank him in the number of first-rate poets, at least give him a title to be placed much above the vulgar tribe of old versifiers. Roscoe's Life of Leo X. Gen. Biog.

VIDAME, Vice-dominus, was anciently used for the bishop's deputy in temporals; as *comes*, or *vice-comes*, was the king's.

The word, according to Nicod, comes from *vicarius;* or according to Pasquier, from *vice-dominus; dom* signifying *dominus*, or *lord.* See Dom.

The original institution of vidames was for the defence of the temporalities of bishoprics, while the bishops themselves were taken up in prayer and other spiritual functions. They also led the bishop's forces when they were obliged to go to war, either to defend their temporalities, or for the arrier-ban.

They also managed, and pleaded, their cause in courts of justice; distributed justice among their tenants; and prevented any body's pillaging, or damaging, the houses of deceased bishops, &c. In effect, they represented the bishop, considered as a temporal lord.

In some ancient charters, the vidames are called *advocates*, or *advowees.*

Vidame continued to be a title of signory, or lordship; attributed to several gentlemen in France: as the vidame of Chartres, of Amiens, &c.

The ancient vidames, Pasquier says, were the bishops' temporal judges; and they had the same privileges as the viscounts.

By degrees, the vidames converted their office into a fee; and the bishops their vidames, or judges, into vassals; as kings did their counts, dukes, &c. Accordingly, the vidame of Chartres, &c. held lands of the bishops of those places. See Valvasor.

VIDDIN, in *Geography*, a town of European Turkey, in Bulgaria, on the Danube, the see of a Greek archbishop; 356 miles N.W. of Constantinople. N. lat. 44° 25′. E. long. 22° 26′.

VIDE, in *Fr. Music*, is equivalent to *open*, in English: as *corde à vide*, an open string, on instruments with a neck, such as a violin or violoncello; or the sound produced by the whole length of a string from the nut to the bridge, without the pressure of a finger.

The sound of open strings is not only more grave or lower in tone than when pressed by the finger, but more sonorous and full; which arises from the softness of the finger which impedes its vibrations: on which account good players on the violin avoid using *open* strings as much as possible, in order to preserve an equality of tone. But to do this, the performer must know all the *shifts*, and be well acquainted with the finger-board. See Shift and Finger-board.

VIDEO, Monte, in *Geography*. (See Montevideo.) This, says Mr. Mawe, is a tolerably well-built town, situated on a gentle elevation, at the extremity of a small peninsula, and is walled entirely round. Its population amounts to between 15,000 and 20,000 souls. The harbour is the best in the Rio de la Plata, and has a very soft bottom of deep mud, but cannot be called a good one for vessels above 300 or 400 tons. The houses are generally of one story, paved with brick, and furnished with few conveniencies. In the square is a cathedral, and opposite to it an edifice, divided into a town-house, or cabildo, and a prison. The streets are unpaved, and the well that supplies the town with water is at the distance of two miles. Provisions are abundant and cheap, particularly beef. The inhabitants, especially the Creolians, are humane and well-disposed, when not actuated by political or religious prejudices. Their habits, like those of their brethren in Old Spain, proceed from the opposite extremes of indolence and temperance. The ladies are generally affable and polite, and in their persons neat and clean. Abroad they usually appear in black, and always covered with a large veil, or mantle; and at mass they always appear in black silk, bordered with deep fringes. The chief trade of Monte-Video consists in hides, tallow, and dried beef; the two former being exported to Europe, and the latter to the West Indies, especially to the Havannah. Coarse copper from Chili, in square cakes, is sometimes shipped here, and an herb called "metta," from Paraguay, the infusion of which is used as tea in England. The climate is humid; in the winter months (June, July, and August) the weather is occasionally boisterous, and the air piercing. In summer, the serenity of the atmosphere is often interrupted by tremendous thunder-storms and lightning, and also deluges of rain, which sometimes destroy the harvest. The heat is troublesome, and the mosquitoes are peculiarly injurious. The town stands on a basis of granite: and the high mount on the opposite side of the bay, on which is a light-house, and which gives name to the town, is principally composed of clay-slate in laminæ, perpendicular to the horizon. The vicinity of Monte-Video is agreeably diversified with low gently sloping hills, and long valleys watered by beautiful rivulets, but traces of cultivation are rarely observed.

VIDEROE, one of the Faroer islands. N. lat. 61° 59′.

VIDICINORUM Oppidum, in *Ancient Geography*, a town of Italy, in Picenum, destroyed by the Romans.

VIDIGAL, in *Geography*, a town of Portugal, in the province of Algarve; 18 miles N. of Sagres.

VIDIGUEIRA, a small market-town of Portugal, in Alentejo; 12 miles N.E. of Beja, and 5 leagues from Serpa, in a very charming country. On one side is a fertile plain, on the other, close to the town, rise mountains, intersected with valleys, that are adorned with quintas and orange-gardens, with a large Gothic church on the fore-ground. The place is small, having little more than 2000 inhabitants. Its oranges are small, but well-flavoured, and the best in the country, as is also the wine, from the neighbouring Villa de Trades, much celebrated at Lisbon.

VIDIMARUM, in *Botany*, the name of the tree which bears the sebestens, a medicinal plum, of Asia and Ægypt.

VIDIMUS, in *Law*, the same with *innotescimus;* being letters patent of a charter of feoffment, or some other instrument, not of record.

VIDINI, in *Ancient Geography*, a people of European Sarmatia. Ammian. Marcell.

VIDOTARA, a bay on the northern side of Great Britain, near the mouth of the river which runs by Aire.

VIDOURLE, in *Geography*, a river of France, which runs into the lake of Than, near Aignes Mortes.

VIDRA, a town of Spain, in Catalonia; 12 miles N. of Vique.

VIDROPUSK, a town of Russia, in the government of Tver; 12 miles N. of Torzok.

VIDRUS, in *Ancient Geography*, a river of Germany; its mouth, according to Ptolemy, being between Marmanis Portus and the mouth of the river Amasius.

VIDUA, a river on the northern coast of Hibernia. Ptol.

VIDUCASSES, the name of a people who occupied a part of that country which is now the diocese of Bayeux. The capital of these people was near the river Orne, a little above Caen, probably Vieux.

VIDUCHOVA, in *Geography*. See FIDDICHOW.

VIDUITATIS PROFESSIO, the making a folemn profeffion of living a chafte widow; a cuftom heretofore obferved in England, and attended with divers ceremonies.

VIE. See CESTUR *qui Vie*.

VIE, in *Geography*, a river of France, in the department of the Vendée, which runs into the fea near St. Gilles.—Alfo, a river of France, in the department of the Calvados, which runs into the Dive, 3 miles N.W. of Crevecœur.

VIECHTACH, a town of Bavaria; 13 miles S.E. of Cham.

VIEDAM, or VEDAM, the name of a facred book of law and religion, written, according to M. de Sainte-Croix, by the Samaneans, in the Samfcretan, or Shanfcrit language, and held in great veneration by the Brahmins of Hindooftan, from a notion that Brahma, their legiflator, received it from the Deity himfelf. See VEDA.

VIEDENBRUCK, or VIDENBRUGGE, in *Geography*. See WIEDENBRUCK.

VIEJO, one of the fmall Bahama iflands.

VIELBRUN, or FELBRUN, a town of Germany, in the county of Wertheim; 17 miles W. of Wertheim.

VIELLA, a town of France, in the department of the Gers; 10 miles S.W. of Nogaro.—Alfo, a town of Spain, in the province of Catalonia; 38 miles W.N.W. of Urgel.

VIELLE, a mufical inftrument, often confounded with the *viole*, or *viol*. It is not, indeed, a *bowed* inftrument, like the viol, but its tone is produced by the friction of a wheel, which performs the part of a bow. The ftrings are preffed on the wheel by the fingers, and fometimes by keys. It is at prefent a mere ftreet inftrument every where but at Paris, where it is much in ufe with other inftruments at the Boulevards and Guinguettes; and even ladies fometimes condefcend to learn to play upon it. Kircher gives it no better title than that of *lyra mendicorum*, the beggar's lyre. It is fo loud in the open air, that it feems impoffible to bear it in a room. The itinerant performers on this inftrument are generally Savoyards.

The name of the inftrument feems a corruption of *viole*, if it is not the eldeft of the two. The Dict. Etymol. fays; *Viole, Violon*, from the Spanifh *biola* and *biolone*. The Spaniards alfo fay *biuela*, whence we (the French) have *Vielle*. It has a neck or finger-board fretted, and two ftrings, always founding as drones, tuned fifths or eighths.

VIELLE, *La*, in *Geography*, a town of France, in the department of the Lower Pyrenées; 21 miles N. of Pau.

VIELLE *Ridée*, the *Wrinkled old Woman's Shell*, in *Conchology*, a name given by the French authors to a fpecies of chama of the mutilated kind, very much refembling the famous concha Veneris, but longer, and without that peculiarly-fhaped oval aperture to which that fhell owes its name.

It has feveral fpines about the lips, as the concha Veneris has, but they are fhorter, and more obtufe, than in that fhell. The whole furface of this fpecies is deeply and irregularly wrinkled. It is of a whitifh colour, variegated with brown.

VIELLEUR, in *Natural Hiftory*, the name of a fpecies of fly common in Surinam, and fome other places. It is moderately large, though lefs fo than the lantern-fly, fo common in that place, and has a long head, and fome other particulars, in which it refembles that creature. Mrs. Merian has given a figure of it, and reports it as the opinion of the natives, that it changes at length into a lantern-fly.

VIELMUR, in *Geography*, a town of France, in the department of the Tarn, on the Agout; 9 miles W. of Caftres.

VIELSK, a town of Ruffia, in the government of Vologda, on the Vaga; 156 miles N.N.E. of Vologda. N. lat. 61° 40'. E. long. 41° 44'.

VIENENBURG, a town of Weftphalia, in the bifhopric of Hildefheim; 7 miles S. of Schladen.

VIENNA, or VIENNENSIUM CIVITAS, in *Ancient Geography*, one of the moft opulent towns of Gaul, and the capital of the Allobroges. This town enjoyed the rights of a Roman city, and the prerogative of furnifhing fubjects for the fenate of Rome, granted to it, according to Tacitus, under the confulate of Rutilius, in the year of Rome 664. This place is mentioned by Strabo as the moft confiderable among the Allobroges. Mela ranks it among the moft opulent in the Narbonnenfis, and it is cited by Pliny under the denomination of a colony. By the firft divifion of ancient Narbonnenfis, Vienne became the metropolis of that diftrict, which was diftinguifhed by the name of the Viennois, and this province was formed at the beginning of the fourth century, fince it is mentioned in the acts of the council of Arles, held A.D. 314. See VIENNE.

VIENNA, in *Geography*, a city and capital of Auftria, the fee of an archbifhop, on the W. fide of the Danube, on a fertile plain, where it receives a fmall river, called *Vien*, which paffes through the city and fuburbs; near the place where ftood the ancient Vindobona. The fituation is pleafant, for to the eaft and north the country around is entirely level, but to the weft and fouth is feen a range of mountains, which are thickly planted with trees and vines; and the Danube, which is here very wide, divides itfelf in that part of the town into feveral arms, forming many iflands, which are ftocked with wood. The circumference of that which is properly the fortified city of Vienna is not large, and only contains about 60,000 fouls; but the fuburbs are therefore the more ample; and, according to the eftimate of a late traveller, the city and the fuburbs together contain 230,000 (others fay 254,000) inhabitants, without including the garrifon. In 1795, the whole population of Vienna was computed at 231,105 inhabitants; of whom 1231 were ecclefiaftics, 3253 nobility, 4256 public functionaries, and perfons living upon their private fortune, and 7333 citizens belonging to the corporation. In the city itfelf there are numerous and beautiful palaces: but the ftreets are not fpacious, and are, in part, crooked. The houfes are generally of brick, covered with ftucco. There is but one ftreet in Vienna that can be called magnificent, and this is a continued line of fplendid houfes and palaces. It is called the "Nobles'-ftreet." The fuburbs are conftructed on a better plan, and would be very elegant, if the houfes were larger and richer in architectural ornaments. Moft of the ftreets are regular, level and wide, but they are chiefly inhabited by manufacturers and workmen of various trades. Near the centre of the town is a bridge thrown acrofs a deep low ftreet, which admits of the paffage of carriages, whilft the ufual thoroughfare is below, refembling our canals over navigable rivers. Thofe people of fafhion who have no country-feats, or who are prevented by their public employments from leaving Vienna, generally refide in the fuburbs during fummer. The fecond floor of all burghers' houfes is allotted for the refidence of the officers of the imperial court; and the owners can only purchafe an exemption by paying a fum of money for the erection of barracks. It is divided into four quarters, which contain fifteen fquares or public places; that of the court is large and beautiful; in it, between two fountains, is a fuperb monument, built by the emperor Leopold; in the high market-place is a marble monument, reprefenting the marriage of Jofeph and the Virgin, erected in the year 1732. Vienna contains fifty churches

churches or chapels, and twenty-one convents. The chief edifices are the metropolitan church of St. Stephen, the imperial palace, library and arsenal, the house of assembly for the States of Lower Austria, the council-house, the university, and some monasteries. The metropolitan church is a dark Gothic building, richly adorned on the outside with sculpture, and within with thirty-eight altars, mostly of beautiful marble; a great number of relics, jewels, &c. and an ancient vault, in which the archdukes are interred. Here is a mausoleum of Frederic III. which cost 40,000 ducats, and a monument in honour of prince Eugene of Savoy. Near it is a palace of the archbishop. In a chapel belonging to the Capuchins, the princes of the royal family are buried, without pomp, with hardly their names over their tombs. The university of Vienna was instituted in the year 1365, from a college founded about a century before, and is divided into four faculties and four nations, Austrian, Saxon, Hungarian, and Rhenish. It has been much improved since the year 1752. The books in the library are not very numerous; it is open two or three hours morning and afternoon. The imperial library contains about 5000 or 6000 volumes, printed in the 15th century, rare manuscripts, and a very extensive and valuable collection of prints, and is well furnished with useful modern books. It is open three or four hours every morning to the public. The imperial cabinet is very rich in medals, and still more so in natural history. The Academy of Arts is divided into seven classes, each of which has its own professor. A taste for music is likewise very general; and the theatre at Vienna has been liberally encouraged. It must be acknowledged, however, that liberty does not flourish here. It is said that the list of prohibited books is scarcely exceeded by that of the Index Expurgatorius at Rome. Nevertheless it has an university, as we have already mentioned, and some considerable schools, principally with a view to commerce. Education needs or demands greater encouragement. The people are in general honest, and simple in their manners. Their ruling propensity is that for luxurious living, both as to food and drink. The women are handsome, and mild in their manners. They love dress, and are addicted to luxury. Music is the principal object of their attention. The Augarten and the Prater are the principal promenades. The police of Vienna is so well conducted, that the streets are remarkably quiet and orderly, so that as early as ten o'clock at night silence prevails. The suburbs are far larger than the city itself. They are adorned with a great number of spacious gardens, and many of the buildings occupy a large space of ground. They lie round it, but are removed to the distance of 500 or 600 common paces from the works of the fort. The line which incloses them and extends on both sides to Leopoldstadt, was, in the year 1794, thrown up against the Hungarian rebels, and afterwards lined with bricks, the gates and entries to it being always kept by regular guards. These suburbs stand for the most part under the jurisdiction of the town-council, to whom an appeal lies from the sentence of the judge and his assessors, with which each suburb is provided. Of them, Leopoldstadt is the largest and chiefest. It lies next the town, on an island in the Danube, being formerly called the Jews' town; but the emperor Leopold, in 1670, having driven that people from thence, it took its name from him. It contains one parish church, two cloisters, the old imperial favorita, a citadel, which, in 1683, was miserably laid waste by the Turks, and but a small part of it repaired; together with the adjoining extensive au-garden, and many considerable fine houses and gardens. On an island in the Danube, well planted with wood, is the Prater, or imperial park, and to the S. is the chapel of Herenhartz, much frequented in Lent for the sake of amusement as well as of devotion. In one of the suburbs is the palace of Belvidere, which formerly belonged to prince Eugene; and at the distance of a few miles stands Schombrun, another imperial palace. The garrison of Vienna consists of one regiment of foot. Provisions are brought to Vienna from the different parts of Austria, and other countries belonging to the emperor, in the greatest plenty and variety. The police pays particular attention to the supply of provisions, and often inspects the markets, and the weights and measures of the dealers. A modern traveller says, he has seen a score of wild hogs and a dozen stags in the game-market at the same time, and hares, literally, by cart-loads, with abundance of pheasants and partridges. Every kind of bird seems to be an article of food, and none rejected; hawks, jays, magpies, are brought to market, and even the bulfinch and robin are not spared. The livers of geese are esteemed a great delicacy; and in the fish-market are found, with sturgeon, carp, pike, tench, and trout, tortoises, frogs, and snails. The manufactures of Vienna are numerous; that of cotton on the increase, that of silk much regarded, and embroidery encouraged. The people of Vienna, upon the whole industrious, excel in manufactures of steel, carriages of all sorts, silk, ribbands, harness, saddles, &c. The inland commerce, carried on by the Danube, is not inconsiderable. The people delight in the combats of wild beasts and of bulls. Vienna owes its first aggrandizement to Henry I. duke of Austria, who, about 1142, made it the place of his residence; it was then a town, and in 1158 was surrounded with walls. In 1198 it obtained its municipal privileges, and was better fortified. The mortality of this city is thought to be greater than that of any other place in Europe; and it is commonly said that one in twenty dies annually: a late traveller, Küttner, supposes the mortality much greater. Although Vienna be much exposed to the N. and E. winds, yet the southern hills serve as a fence against the rain, so that the traveller rather complains of dust than of moisture. The summer heats, on account of its situation in the midst of hills and mountains, which collect much snow and ice in winter, last only about two months, and in winter the cold is often very severe. The pleasantness of the environs is said to be much enhanced by the happy aspect of the Austrian peasantry of this city. The number of those who fall victims to pulmonic diseases is very large, and many have been carried away by the small-pox, the ravages of which, it is hoped, will be restrained by the introduction of the practice of inoculation for the cow-pox. The establishments for the relief of the sick are very numerous; such are the Great Hospital, which in 1796 received 11,860 patients; and within its walls is contained a pathological museum; the hospital for lying-in-women, which in the above-mentioned year received 1904 women; the lunatic hospital, which in the same year accommodated 261 insane persons; a military hospital; and an hospital for Jews, excellently managed. The suburbs of the town, according to a singular and useful institution founded by Leopold, are divided into eight districts, each of which has its physician, surgeon, and midwife, all paid by government, whose office it is to visit the poor at their own houses. In the year after its establishment this institution was extended to the whole city. Another institution has the charge of diseased children under ten years of age. In 1796 it was ordained, with a view to the public health, that no new-built house should be inhabited before the physician of the district had examined whether the walls were sufficiently dry; 175 miles S. of Prague. N. lat. 48° 13′. E. long. 16° 23′.

Vienna, a port of entry and post-town of the eastern shore

shore of Maryland, in Dorchester county, on the W. side of Nanticoke river, about fifteen miles from its mouth. It contains about thirty houses, and carries on a brisk trade with the neighbouring sea-ports, in lumber, corn, wheat, &c.; 15 miles N.W. of Salisbury, and 120 from Washington.—*Also*, the capital of Greene county, Kentucky, on the N. side of Green river; about 158 miles W.S.W. of Lexington.—*Also*, a town of Kennebeck county, in the district of Maine, incorporated in 1802, including the late plantations of Goshen and Wyman: the number of inhabitants is 417.—*Also*, a post-town in Abbeville county, South Carolina; 651 miles from Washington.—*Also*, a town in Ohio county, Kentucky, containing 26 inhabitants.

VIENNE, a town of France, and principal place of a district, in the department of the Isere, situated on the left side of the Rhône, over which was formerly a stone-bridge, built in the year 1265, now destroyed. A Roman colony was established here, and called Vienna Allobrogum. In the fifth century it was taken by the Burgundians, and the kings made it their place of residence. In the ninth century it was the capital of the kingdom of Provence. It was afterwards erected into an archbishopric, and became the capital of a province called Viennois, in which state it remained till the revolution, when the archbishopric was suppressed. In 1311, a council was held here by order of pope Clement V. in which, among other matters, the suppression of the knights Templars was determined; 10 posts N. of Valence. N. lat. 45° 32′. E. long. 4° 58′.

VIENNE, a town of France, in the department of the Loir and Cher, on the south side of the Loire, opposite Blois.

VIENNE, a river of France, which rises about three miles E. of Tarnac, on the borders of the departments of the Correze and the Creuse, passes by or near to Tarnac, Aimoutier, St. Leonard, Limoges, Aix, St. Junien, Chabanois, Confolent, St. Germain sur Vienne, Availle, Isle Jourdain, Lussac, Chavigny, Châtellerault, Isle Bouchard, Chinon, &c. and joins the Loire, in the department of the Indre and Loire, about five miles above Saumur.

VIENNE, one of the nine departments of the western region of France, formerly a part of Poitou, in 46° 30′ N. lat., bounded on the N. and N.E. by the department of the Indre and Loire, on the E. by the department of the Indre, on the S. by the departments of the Charente and Upper Vienne, and on the W. by the department of the Two Sevres. The department of the Maine and Loire joins it a little to the N.W. The territorial extent of this department is 7340 kiliometres, or 364 square leagues, and it contains 250,807 inhabitants. It is divided into 5 circles or districts, 31 cantons, and 344 communes. The circles are Loudun, comprehending 32,256 inhabitants; Châtellerault, 46,518; Montmorillon, 48,570; Civray, 38,971; and Poitiers, 84,492. Its capital is Poitiers. According to Hassenfratz, its extent in French leagues is 21 in length, and 13 in breadth; its circles are 6, its cantons 49, and its population 257,953. Its contributions in the 11th year of the French era amounted to 1,979,952 fr.; and its expences, administrative, judiciary, and for public instruction, to 280,570 fr. 35 cents. This department is diversified with hills, plains, heaths, and cultivated lands, yielding grain, wine, fruits, flax, and good pastures. It has considerable forests.

VIENNE, *Upper*, one of the nine departments of the upper region of France, formerly Limosin, in 46° N. lat., bounded on the N. by the departments of the Vienne and Indre, on the E. by the department of the Creuse, on the S.E. by the same department, on the S.W. by the department of the Dordogne, and on the W. by the department of the Charente. The territorial extent of this department is 6002½ kiliometres, or 288 square leagues, and its population consists of 259,795 inhabitants. It is divided into 4 circles, 26 cantons, and 224 communes. Its circles are Bellac, including 85,388 inhabitants; Limoges, 92,637; St. Yriuix, 38,251; and Rochechouart, 43,519. Its capital is Limoges. According to Hassenfratz, it is in length 26 French leagues, and in breadth 12; its circles are 5, and cantons 40, and the number of its inhabitants 266,910. The contributions of this department, in the 11th year of the French era, amounted to 1,645,147 fr.; and its expences, administrative, judiciary, and for public instruction, were 241,803 fr. 33 cents. The soil of this department is, in general, of an indifferent quality; yielding rye, little wheat, and tolerable pastures. The hills are covered with chesnut-trees and woods. Here are mines of iron, lead, copper, coal, and quarries of marble.

VIENNE *le Château*, a town of France, in the department of the Marne; 6 miles N. of St. Menehould.

VIENS, a town of France, in the department of the Mouths of the Rhône; 3 miles E.N.E. of Apt.

VIEPREZ, a river of Poland, which rises 16 miles W. of Lublin, and runs into the Vistula near Stezicza, in the palatinate of Sandomirz.

VIEPRIE, a town of the Popedom, in the duchy of Spoleto; 5 miles N.E. of Todi.

VIERINGEN, or WIERINGEN, an island in the Zuyder See, of an oval form; about six miles in length, and, where widest, rather more than two in breadth; 6 miles S.E. from the Texel.

VIERRADEN, a town of Brandenburg, in the Ucker Mark, on the Welse, near its union with the Oder; 24 miles S.E. of Prenzlow.

VIERUEDRUM, or VERVEDRUM, in *Ancient Geography*, a promontory of the isle of Albion, according to Ptolemy.

VIERZON, in *Geography*, a town of France, and principal place of a district, in the department of the Cher, near the conflux of the Eure and Cher; 11 posts S. of Orleans. N lat. 47° 13′. E. long. 2° 9′.

VIESCAS, a town of Spain, in the kingdom of Aragon; 10 miles from Jaca.

VIESCHORN, a mountain of Switzerland, in the canton of Bern, and bailiwick of Grindelwald.

VIEST, or UJEST, or *Oyest*, a town of Silesia, in the principality of Oppeln; 14 miles W.N.W. of Gleiwitz.

VIESTI, a town of Naples, in Capitanata, on the coast of the Adriatic, the see of a bishop, suffragan of Manfredonia; 29 miles N.N.E. of Manfredonia. N. lat. 41° 56′. E. long. 33° 52′.

VIETA, FRANCIS, in *Biography*, a very eminent mathematician of the 16th century, was born at Fontenai, in Poitou, in the year 1540. Although he occupied the post of master of requests at Paris, and his time and attention were much engaged by the duties of his office, he was indefatigable in his application to mathematical studies; so that he is said to have remained in his apartment for three days, without either eating or sleeping. In his writings he manifests great originality of genius, as well as invention. For a brief account of his improvements in *algebra*, we refer to that article. On other branches of the mathematics, besides those that may be denominated analytical, he bestowed much attention and labour; and whilst he collected and detailed what others had done before him, he enlarged the boundaries of science, and made some important and useful additions

additions to the stock of knowledge which had been amassed by his predecessors. In this respect he was not a mere labourer, but original and ingenious in his communications. His treatise on "Angular Sections" is a performance which enabled him to resolve a curious problem, proposed by Adrian Romanus to mathematicians, and which amounted to an equation of the 45th degree. Romanus was so impressed by his sagacity, that he travelled from Wirtemberg in Franconia, where he resided, as far as France, in order to visit Vieta, and cultivate friendship with him. His "Apollonius Gallus," or restoration of Apollonius's tract on Tangencies, not to mention other pieces that may be found in his works, displays powers of invention, eminently adapted to the more sublime geometrical speculations. His tracts on trigonometry, plane and spherical, with the tables annexed to them, were important and valuable at the time when they were published, and without doubt led the way to farther modern improvements. We have no reason for believing that Vieta was irritable and querulous; but his disputes with Scaliger and Clavius, more especially with the latter, did him no honour. Scaliger pretended to quadrate the circle, an operation for which he was altogether incompetent, and Vieta evinced his incapacity. With Clavius he had a contest about the emendation of the Gregorian calendar, charging him with ignorance and error; whilst he himself committed mistakes, which Clavius detected. The loss of Vieta's "Harmonicon Celeste," entrusted with father Mersenne, and surreptitiously taken from him, has been much deplored. Others of his works have also been lost, which has been probably owing to his causing few to be printed, and retaining them in his own custody, those excepted which he distributed among his friends and persons of science. Vieta was profoundly skilled in the art of decyphering, which he employed with advantage to his country. Vieta, notwithstanding the intenseness and assiduity of his application, passed his grand climacteric, and died at Paris in December, 1603. After his death, some of his MSS. were published by Alexander Anderson, an ingenious Scots mathematician, a native of Aberdeen; and in 1646, Schooten gave an edition of all his works which he was able to collect. Montucla. Hutton.

VIETRI, in *Geography*, a town of Naples, in Principato Citra; 2 miles N.N.E. of Cangiano.—Also, a town of Naples, in Principato Citra. In 1694 it was destroyed by an earthquake; 2 miles W. of Salerno.

VIEUSSENS, RAYMOND, F.R.S., in *Biography*, was born at a village in Rovergue, and having commenced his education at Rhodez, he pursued the study of physic at Montpellier, where he graduated. In 1671 he was chosen physician to the hospital of St. Eloy. The result of his anatomical researches in this situation was published under the title of "Neurology," and gained him great reputation. His name became known at court, and Mad. de Montpensier, in 1690, chose him as her physician. After her death he returned to Montpellier, and directing his attention to chemistry, he found an acid in the caput mortuum of human blood; and on this imagined discovery founded a theory, which he communicated to the different schools of medicine. In advanced life his writings were multiplied, without augmenting his reputation. He died in 1726. His most valuable work is his "Neurologia Universalis," Lyons, 1685, folio, which is commended by Haller, and which exhibits a more accurate dissection of the brain than that of any preceding writers. After his death appeared "Histoire des Maladies internes," 4to., containing many practical observations. Haller. Eloy.

VIEUSSEUXIA, in *Botany*, was so called by Dr. Daniel de la Roche, in his inaugural dissertation, published at Leyden in 1766, in honour of his countryman and friend M. Vieusseux, an excellent botanist; of whom, however, we know not that the world has heard any thing further, or that he has written any thing relative to this science. The genus in question was thought, by its truly intelligent and ingenious author, to be intermediate between *Iris* and *Ferraria*. It has not been adopted by Thunberg, Ker, or any of our popular botanists, who have declined separating it from *Iris*, there appearing no distinctive character, except the stamens being united into a tube. The learned Decandolle, on the contrary, has adopted *Vieusseuxia*, in Ann. du Mus. v. 2. 141. t. 42. He is followed by Redouté, who figures the same species, *V. glaucopis*, in his *Liliacées*, v. 1. t. 42, and mentions seven species in all; as well as by Desfontaines, in his recently-published Tableau de l'Ecole de Botanique du Jardin du Roi, ed. 2. 37. Most, if not all, of the plants supposed to constitute the above genus, are, we believe, comprehended as varieties by Thunberg under his *Iris tricuspis*. See his dissertation on *Iris*, p. 15; also Willd. Sp. Pl. v. 1. 231.

VIEUX MAISONS, in *Geography*, a town of France, in the department of the Aisne; 6 miles W. of Montmirail.

VIEUX *Marché*, a town of France, in the department of the North Coast; 8 miles S. of Lannion.

VIEVY, a town of France, in the department of the Côte d'Or; 6 miles S. of Arnay le Duc.

VIEW, VISUS, in *Law*, the act of *veiors*, or *viewers*.

This is called by Bracton, "Res quasi sacra, quia solam personam regis respicit, et introducta pro pace, et communi utilitate."

When a real action is brought, and the tenant knows not well what the land is, that the demandant asks; he may pray the view: which is, that the jury may *see* the land which is claimed.

This course of proceeding we received from the Normans, as appears by the Grand Customary. It is used in various cases; as in assize of rent-services, rent-charge, rent-sec; in a writ of nuisance; in a writ quo jure; in the writ de rationabilibus divisis, &c. See JURY.

VIEW *of Frank Pledge*, *Visus Franci Plegii*, is the office which the sheriff in his county-court, or the bailiff in his hundred, performs; in looking to the king's peace, and seeing that every man be in some pledge. See COURT-*Leet*, and FRANK-*Pledge*.

VIEW, in matters of *Optics*, *Perspective*, &c. See VISION.

VIEW, *Point of*. See POINT.

VIEW, among *Hunters*, the track, or print of the feet, of a fallow deer on the ground.

VIEW *a Place*, *To*, in the *Military Art*, is to ride about it, before the laying of a siege, in order to observe the strength or weakness of its situation and fortification.

VIEWERS, or VEIORS, in *Law*. See VEIOURS.

VIEYRA, ANTONY, in *Biography*, a Portuguese writer, was born at Lisbon in 1608, and in early life accompanied his father to the Brasils. His genius at the age of fourteen began to display itself to a degree that excited the astonishment of his tutors. In 1623 he entered into the society of Jesus, and having carefully read the scriptures, the works of the fathers, and the Summa Aquinatis, he composed some tracts, and gave lectures in the college of Bahia. At this time he was tutor to the son of the viceroy of Brasil, the marquis of Montalvan; and in 1641 accompanied him to Europe. At Lisbon he distinguished himself in the pulpit, and was appointed by John IV. preacher to the court. The king, discovering also his talents for public affairs, deputed him, in 1646, on important business to England,

England, Holland, and France, and also to the court of Rome. For the services rendered in these missions he was offered a bishopric, which he declined accepting, and requested only to be employed as a missionary among the savages in the forests of Maragnan. The king demurred against acceding to this proposal, but urged him to accept a bishopric, which he still refused; but with some other Jesuits he embarked in a ship, in order to proceed to Maragnan. Soon after his arrival there in 1653, he was sent to Portugal, in order to obtain an order from the king, that the Portuguese settled in the Brasils should treat the Indians with less cruelty. He succeeded in the object of his mission, but he was not allowed to return to America, though he went thither some time after; and in less than six years, in a district more than 600 miles in extent, he formed an establishment similar to that in Paraguay. There the Indians were instructed, and availing themselves of their knowledge, began to live like men, and to practise the virtues which Christianity taught them. The Portuguese residing in Brasil were alarmed, and could not bear that the Indians, whom they treated as slaves, should enjoy the blessings of liberty: they, therefore, seized Vieyra and his attendants, and transported them to Portugal, under a charge of their joining the Dutch in forming a plan for expelling all the Portuguese from Brasil. Vieyra and his associates were able to prove their innocence, and succeeded in obtaining the reinstatement of all their brethren in the colleges and other establishments of Maragnan. Vieyra remained in Portugal, and, at the desire of the queen and ministers of state, drew up a remonstrance, which was presented to king Alphonso, respecting the irregularities and abuses that prevailed in the kingdom. The king's favourites were incensed, and, in 1663, those who were attached to the queen, and who wished to promote the welfare of the nation, were sent into banishment. Vieyra was first conveyed to Oporto, and soon after to Coimbra; and for the more certain and speedy decision of his fate, he was committed into the hands of the inquisition. Many charges were alleged against him; however, in 1667, when the influence of the favourites terminated, he was freed from the inquisition, and sent to Lisbon. He was merely forbidden to preach; but this prohibition was revoked, when the queen, Maria Isabella of Savoy, and the infant Don Pedro, then regent of the kingdom, expressed a wish to hear him. In 1669 he was called to Rome, and preached before queen Christina of Sweden, who was so much pleased that she invited him to the conversaziones held in her palace, and requested him to become her confessor. But finding the air prejudicial to his health, he returned to Lisbon, after having obtained from pope Clement X. a letter of exculpation, freeing him from the jurisdiction of the inquisition, and rendering him immediately amenable to the college of cardinals. Vieyra, upon the recovery of his health, set sail for Brasil; and being incapable, on account of his advanced age, of superintending the mission of Maragnan, of which he had been long superior general, he spent his time in revising his writings, and preparing for the termination of his life, which happened at Bahia in 1697, when he had attained nearly the 90th year of his age. His interment was conducted with great pomp, his coffin being borne to the grave by the viceroy and his son, and other persons of distinction. The Portuguese consider Vieyra as the best writer their country ever produced. His works were published at Lisbon between 1679 and 1718, in 14 quarto volumes. Gen. Biog.

VIF, Fr., in *Music*, lively. See VIVACE. This word, says Rousseau, implies a movement, gay, cheerful, and animated; and requires a bold execution, full of fire.

VIF, in *Geography*, a town of France, in the department of the Isere; 9 miles S. of Grenoble.

VIFALU, a town of Hungary; 16 miles S.S.E. of Ketskemet.

VIG, a lake of Russia, in the government of Olonetz. N. lat. 63° 30′. E. long. 34° 14′.—Also, a river of Russia, which passes through lake Vig, and runs into the White sea, 20 miles S. of Kemi.

VIGAN, LE, a town of France, in the department of the Lot; 17 miles N. of Cahors.—Also, a town of France, and principal place of a district, in the department of the Gard; 36 miles W.N.W. of Nismes. N. lat. 43° 59′. E. long. 3° 40′.

VIGANONI, GIUSEPPE, in *Biography*, a tenor singer in the Italian opera, first arrived in England in 1782, as first man in the comic opera, in which part Lovatini had rendered us very difficult to be pleased. Trebbi, his immediate successor, was a very useful performer, as he occasionally had a part assigned him in the serious opera; but he excited no raptures in either serious or comic parts. And Jermoli and Tasca, his successors, were still less interesting. The same might perhaps be said of Viganoni, with a small diminution of praise. His singing did not appear to us in a style of expression that was genuine Italian; it seemed to savour of German or French expression, or of both.

On his second arrival in London, he had less voice than when he came here first; but more knowledge of music, a greater variety of embellishments, and more use of the stage. His voice was never powerful, and now he had more falset than real notes in his scale; and such a rage for gracing and changing passages, that he scarcely ever let the audience hear a single passage as it was written by the composer. He certainly knew his business, and was a good musician; but his style of singing was what painters would call *manière*: for with all his *rifioramenti*, or embellishments, of which he was so lavish, his performance seemed monotonous.

VIGASIO, in *Geography*, a town of Italy, in the Veronese; 10 miles S. of Verona.

VIGENNE, a river of France, which runs into the Saône, at Talmey.

VIGEOIS, a town of France, in the department of the Correze, on the Vezere; 4 miles S. of Uzerches.

VIGER, an island in the North sea, on the coast of Norway; 10 miles round. N. lat. 62° 35′. E. long. 6° 30′.

VIGESIMA, among the Romans, a tax of the twentieth part of the yearly incomes of all inheritances. It was first established by Augustus.

VIGESIMA was likewise a custom paid for slaves sold, as also for one made free.

VIGESIMARIUS, among the Romans, an officer who had the management of collecting the vigesima.

VIGEVANO, in *Geography*, a town of Italy, in the department of the Gogna, capital of a small district, in the principality of Piedmont, lying between the Novarese and the Lumelline, on the Tesin, the see of a bishop, suffragan of Milan; 13 miles S.E. of Novara. N. lat. 45° 19′. E. long. 8° 53′.

VIGGIANO, a town of the island of Corsica, in the district of Tallano.

VIGHIZZOLA, a town of Italy, in the Paduan, near a lake which abounds in fish, especially eels; 16 miles S. of Padua.

VIGIA, a town of Brasil, in the government of Para; 50 miles N.N.E. of Para.—Also, a rock near the south coast of Cuba. N. lat. 21° 32′. W. long. 84° 32′.—Also, a rock

a rock near the south coast of Cuba. N. lat. 20° 53′. W. long. 80° 55′.

VIGIL, or Eve, in *Church Chronology*, the day before any feast, &c.

Though the civil day begins at midnight, yet the ecclesiastical or scriptural day begins at six o'clock in the evening, and holds till six in the evening the ensuing day.

Hence, the collect for every Sunday and holiday, by order of the church, is to be read, at the preceding evening service, that is, at six o'clock the day before; from which time the religious day was supposed to begin.

And this first part of the holiday, from six o'clock the day before, was, by the primitive Christians, spent in hymns, and other devotions; and, being often continued till late in the night, was called *vigil*.

These vigils came by degrees to be so enlarged, that, at last, all the day preceding the holiday was called by the name.

The origin of vigils is deduced by Forbes from a custom in the ancient church, for the people, both men and women, to meet together in the evening before Easter-day, and watch and pray, as expecting the coming of our Lord, who was to rise early in the morning. This practice, Tertullian observes, *ad uxorem*, afterwards got to other feasts, and saints' days. But abuses creeping in, they were forbidden by a council, in 1322, and, in lieu of them, fastings were instituted on the day before, though still called by the ancient name of vigils. See Wakes.

Vigil *Coma*. See Coma.

VIGILANTIUS, in *Biography*, an ecclesiastic of the fifth century, was born in Gaul, and removing to Spain, became a parish priest in the diocese of Barcelona. He is said to have written treatises on religious subjects in a polished style; but he incurred the censure of Dupin, because he exposed several superstitions of the time in which he lived. After his return from a voyage to Palestine and Egypt, he propagated opinions that were hostile to the corrupt state of Christianity at that period. He denied that the tombs and remains of the martyrs are entitled to any kind of adoration, and censured pilgrimages to holy places. He derided the miracles pretended to be wrought at the shrines of martyrs, and condemned the nocturnal assemblies held at such places. He affirmed that the practice of burning tapers by day-light at the tombs of holy persons was a superstition, borrowed from the Pagans; that prayers addressed to departed saints were of no avail; and he spoke with contempt of fastings and mortifications, the celibacy of the clergy, and the austerities of monastic life. He also asserted, that the voluntary poverty of those who distribute all their substance to the poor, and the practice of sending donations to Jerusalem for pious purposes, are in no respect acceptable to the Deity. These opinions were favourably received by several of the bishops in Gaul and Spain; but Jerom, the great advocate for monkish discipline, censured them with severity, and rancorously abused Vigilantius for adopting and propagating them. His opposition, and that of persons of similar sentiments prevailed, and prevented every kind of reform. The resentment and hostility of Jerom, to whom Vigilantius had been recommended by Paulinus, seem to have commenced with his declaring himself an enemy to superstition. Bayle. Dupin. Mosheim.

VIGILIA, in *Ancient Chronology*. See Watch.

Vigilia, that state of an animal which is opposite to sleep, and is popularly called *waking* or *watching*. See Sleep and Watching.

VIGILIÆ, in *Antiquity*, denote the watches and guards among the Roman soldiers, who performed duty by night, in contradistinction to the *excubiæ*, who kept guard by day, either in the camp, or at the gates and intrenchments: of these last there seem to have been assigned one company of foot and one troop of horse to each of the four gates every day; and it was a most unpardonable crime to desert their post, and to abandon their corps of guards. In the camp, there was allowed a whole manipulus to attend before the prætorium, and four soldiers to the tent of every tribune. The night-guards assigned to the general and tribunes were of the same nature as those in the day. But the proper vigils were four in every manipulus, keeping guard three hours, and then relieved by four others; so that there were four sets in the night, according to the four watches, which took their name from this custom. The night-guard was set by a tally or tessera, with a particular inscription given from one centurion to another through the army, till it came again to the tribune who first delivered it. Upon the receipt of this, the guard was immediately set. But because this regulation was not sufficient, they had the *circuitio vigilium*, or a visiting of the watch, commonly performed about four times in the night by some of the horse. Upon extraordinary occasions, the tribunes and lieutenant-generals, and sometimes the general himself, made these circuits in person, and took a strict view of the watch in every part of the camp. Kennet's Ant. Rom. p. 206.

Vigiliæ *Florum*, in *Botany*, a term used by Linnæus to express a peculiar faculty, belonging to the flowers of several plants, of opening and closing their petals at certain hours of the day. Previous to the explanation of this phenomenon, it is necessary to observe, that the flowers of most plants, after they are once opened, continue so night and day, until they drop off, or die away. Several others, which shut in the night-time, open in the morning sooner or later, according to their respective situation in the sun or shade, or as they are influenced by the manifest changes of the atmosphere. But the class of flowers, to which this article refers, open and shut regularly at certain hours, exclusive of any manifest changes in the atmosphere. This property is so evident in one of our common English plants, the *tragopogon luteum*, that our country people have called it *John-go-to-bed-at-noon*. Linnæus's observations in the Philosophia Botania, p. 273, extend to near fifty species, which are subject to this law: such are the male pimpernel, the blue-flowered pimpernel with narrow leaves, the little blue convolvulus or bindweed, the day-lily, the proliferous pink, the common purslain, the white-water-lily, the garden lettuce, the dandelion, the rough dandelion, several species of hawkweeds, wild succory, wild marygold, &c. See an account of this phenomenon by Dr. Pulteney, in Phil. Trans. vol. l. p. 506, &c. See also Sleep *of Plants*.

VIGILIUM Præfectus. See Prefect.

VIGILIUS, in *Biography*, a pope, was raised to the pontificate by the empress Theodora, when his predecessor Silverius did not answer her purpose, on certain stipulated conditions, to which a person like him, destitute of principle, could have no objection. He was, therefore, sent from Constantinople to Italy with a sum of gold, and an order to Belisarius, then master of Rome, to depose Silverius, and to elect Vigilius. Accordingly the measure was accomplished in November 537: Silverius was banished, and Vigilius, a Roman by birth of a noble family, was ordained to the see of Rome. Silverius appealed to the emperor Justinian, and obtained an order for a rehearing; but upon his return to Rome, he was banished to a distant island, in consequence of the intrigues of Vigilius, and there died in 538. After the death of Silverius, the church of Rome acknowledged Vigilius as lawful pope. Although he punctually

punctually fulfilled his engagements to the empress, he wrote a letter to the emperor, in which he solemnly professed the orthodox faith; and in another letter to the patriarch of Constantinople, he commended him for his zeal in favour of the council of Chalcedon, which by his engagement to Theodora he condemned, and anathematized as heretics those persons whom he had lately admitted to his communion. The emperor Justinian, fond of exercising authority in matters of faith, was induced, in 542, to issue an edict, condemning the writings of certain prelates who were inclined to the Nestorian tenets, famous under the appellation of "The Three Chapters;" and his edict was received by almost all the Eastern bishops. Vigilius, at the head of those of the Western churches, refused to concur in what they conceived to be an assumption of authority in matters of faith, which belonged only to a general council. Upon this resistance, Vigilius was summoned by the emperor to repair to Constantinople. He left Rome amidst the curses of the people, who charged him with enormous crimes, and arrived at Constantinople in the beginning of the year 547. At first he declared against the imperial edict, and excluded from his communion the patriarch and all the bishops who had subscribed it. The emperor's measures, however, caused him to waver; and at a council held at Constantinople, he issued a decree, entitled "Judicatum," in which the "Three Chapters" were formally condemned. But when he found that this decree excited a great opposition on the part of the Western bishops, he got it revoked, under a pretence of referring the matter to a general council. Without stating the violence and coercion of the emperor on the one hand, or the resistance and tergiversation of the pope on the other, it will be sufficient to observe, that after Vigilius had a fourth time changed his declaration relating to the "Three Chapters," which he finally condemned by a solemn constitution, he was permitted to return to Rome, which had been in the mean time sacked by Totila, and recovered by Narses. But during his voyage he was seized with a fit of the stone, and obliged to land in Sicily, where he died in 555. A summary of the letters of this pope, still extant, is given by Dupin. Bower. Dupin. Mosheim.

VIGINTIVIRATE, a dignity among the ancient Romans, established by Cæsar.

This dignity comprehended four others; for of the vigintiviri, or twenty men which composed the company, there were three who sat and judged all criminal affairs; three others had the inspection of the coins and coinage; four took care of the streets of Rome; and the rest were judges of civil affairs.

VIGLES, in *Geography*, a town and castle of Hungary; 5 miles S.S.E. of Altsol.

VIGNACOURT, a town of France, in the department of the Somme; 9 miles N.W. of Amiens.

VIGNAIS, or VINHAES, a town of Portugal, in the province of Tra los Montes; 15 miles W. of Bragança.

VIGNE, ANDREW DE LA, in *Biography*, a French writer of the 15th century, bore arms under Charles VIII., and was secretary to his queen, Anne of Britanny. In conjunction with Jaligni, he composed a "History of Charles VIII.," folio, printed at the Louvre, under the care and with the notes of Denis Godefroy. He also wrote "Vergier d'Honneur," Paris, 1495, containing an exact account of the expedition of Charles VIII. against Naples, at which he was present. Nouv. Dict. Hist.

VIGNE, ANNE DE LA, a French poetess, was born in 1634 at Vernon-sur-Seine. Her talent for poetry appeared so soon, that Pelisson said of her, she seemed to have been suckled by the Muses. Menage compliments her with having surpassed the ancients, and excited the jealousy of the moderns, by the beauty and sonorousness of her verse. She is said to have united the study of philosophy with that of polite literature, and her character is represented as no less estimable than her talents. Huet speaks highly of her cheerfulness and amenity, notwithstanding the feebleness of her constitution, and the pains she suffered. She closed life under the anguish of a calculous complaint in 1684, at the age of 50. Her principal pieces are an ode, entitled "Monseigneur le Dauphin au Roi," for which she received from a person unknown a lyre in gold enamelled, with a copy of verses in her praise; "Ode à Mademoiselle de Scudery;" "Reponse à Mademoiselle Descartes;" and several other "Pièces de Vers," collected in a small octavo. Moreri. Huet. Gen. Biog.

VIGNE, PIERRE DELLE, a celebrated minister of the emperor Frederic II., was born of mean parentage in Capua, at the end of the twelfth century; and having pursued his studies to good effect as a mendicant scholar at Bologna, he was introduced to Frederic II., and ingratiated himself with this prince to such a degree, that he gave him a lodging in his court, and the opportunity of further improvement. He became a proficient in civil and canon law, and acquired an elegant style of writing, so that he was advanced by the emperor to the posts of prothonotary of his court, judge, and chancellor; and he became the confident of all his designs. His ability and learning raised him to the highest reputation, and his influence in the court of Frederic was boundless. The emperor afforded him opportunity of amassing immense treasures, and employed him in a variety of the most important embassies, which our limits will not allow us to recount. But before the close of his life, he lost the emperor's attachment and confidence, for which various reasons, none of which are satisfactory, have been assigned. To the jealousy and envy of court attendants, the fall of favourites may often be justly ascribed. Whatever was the cause in this instance, Vigne suffered severely under his master's displeasure: he was deprived of sight, and shut up in prison; and sinking into despair, he put an end to his life. The time of his death is not known. The chronicle of Placentia dates his being blinded in 1248. Six books of letters remain, which Tiraboschi regards as one of the most valuable monuments of the 13th century. The last edition of them is that of Basil, in 1740. He also collected and arranged the laws of the kingdom of Sicily; and to him are attributed a work "Concerning the Imperial Authority," and a book "On Consolation," in imitation of that of Boethius. He also composed some Italian poems. Gen. Biog.

VIGNETTE, in the art of *Printing*, is a French word, now often used among English artists and writers, to denote the flourish or ornament placed at the beginning of a book, preface, or dedication. These vignettes or head-pieces are very various in their form and size. See the description of PRINTING-*Press*.

VIGNIER, NICHOLAS, in *Biography*, an historian and chronologist, was born at Bar-sur-Seine in 1530, and brought up a Protestant. Having lost his property in the civil wars, he withdrew to Germany, and practised physic with reputation and advantage. Upon his return to France, he conformed to the established religion, and was appointed physician to the king, as well as historiographer-royal. One of the most curious of his works is his "Traité de l'Origine et Demeure des anciens François," 1582, 4to., which was translated into Latin by Andrew du Chesne. His other works may be consulted with advantage by those who

who wish to acquaint themselves with French history. This writer died in 1595. Moreri.

VIGNIER, JEROM, grandson of the preceding, was born at Blois in 1606. He was the son of a Protestant minister, educated in that profession, and designed for the law; but in 1628 he abjured Calvinism, and entered into the congregation of the Oratory. He became superior of several houses in his society, and acquired high reputation for piety as well as for extensive erudition. He was more particularly conversant with the oriental and other languages, with medals and antiquities, and with the genealogy of the sovereign houses of Europe. He died at St. Magliore, in Paris, in 1661. His writings of various kinds were numerous. Moreri.

VIGNOLA, a name commonly given to JAMES BAROZZI, from the place of his birth, a small town in the duchy of Modena, an eminent architect, was born in 1507; and as he discovered an early inclination for the arts, he was sent for education to Bologna. From painting, to which he was first attached, he directed his attention to architecture. By various designs, upon the principles of Vitruvius, some of which he communicated to the historian Guicciardini, he acquired early reputation. With a view to further improvement he went to Rome, and was there admitted into the academy of design, newly founded, and employed by it in measuring the most celebrated remains of antiquity. The abbate Primaticcio, who was sent to Rome in 1537, by Francis I. of France, to procure designs of the ancient buildings and casts of statues, availed himself of the assistance of Vignola; and on his return, took him to France. After two years' residence in France, he returned to Bologna, and was employed in forming a plan for the façade of the church of St. Petronius, which, through the envy of his competitors, was not executed till some years afterwards. In and near this city he built some palaces, and constructed the canal of Naviglio, running thence to Ferrara. Unduly recompensed for this work, he went to Placentia, and planned a palace for the duke of Parma. After his return to Rome in 1550, he built several churches there; and by the interest of Vasari, pope Julius III. appointed him his architect. For him he built a villa, and near it the small church of St. Andrew, in form of an ancient temple; and by his command he brought the Acqua Vergine to Rome. After the death of Julius, he was employed by cardinal Alexander Farnese in the construction of his magnificent palace or castle of Caprarola; and he had also the charge of building the church belonging to the professed house of Jesuits at Rome, which is an edifice of extraordinary beauty and grandeur. It was raised only to the cornice before the death of Vignola, and finished by his disciple James della Porta. After the decease of Michael Angelo, Vignola was appointed to succeed him as architect of St. Peter's, in conjunction with Pirro Ligorio, a Neapolitan. This engagement and his advanced age obliged him to decline accepting an invitation from Philip II. to the court of Spain. He was consulted, however, with regard to the different plans given for the Escurial; and one which he furnished was highly approved, though not adopted. His other professional labours were interrupted by a commission from Gregory XIII. to settle the limits between the territories of the church and those of the duke of Tuscany; which commission he executed to the pope's satisfaction. Upon his return from this service, he was seized with a fever, of which he died in 1573, aged 66. His remains were solemnly interred in the church of Sta Maria della Rotunda, the ancient Pantheon. Vignola acquired reputation as an author no less than as a practical artist. His "Rules for the five Orders of Architecture" were formed on the purest taste of antiquity, and have been always reckoned classical and original. This work has been often reprinted, and translated into almost all the European languages. The French translation, with the commentaries of Daviler, is most esteemed. Vignola also wrote a treatise on "Practical Perspective," which has passed through many editions. Tiraboschi. D'Argenville. Gen. Biog.

VIGNOLES, ALPHONSO DE, a learned Protestant minister, was born in 1649 at Aubais, in Languedoc, and received his education chiefly under domestic tutors; and for the study of theology he went to Saumur. He officiated as minister, first at Aubais, and then at Cailar. On the revocation of the edict of Nantes, in 1685, he removed to Brandenburg, and served several churches for 14 years. In 1701 he was elected a member of the Royal Academy of Sciences at Berlin; and in 1703, by the recommendation of Leibnitz, the king ordered him to quit his church, and reside at Berlin, that he might be thus more useful to the Academy. He preached, however, for some years at a church in the vicinity of Berlin. Upon the distribution of the members of the Academy into classes, Vignoles was placed first in that of historians, and afterwards in that of mathematicians. In 1727 he was chosen director of the Royal Academy, which post he occupied with distinguished reputation. He died in 1744, at the advanced age of 95. He contributed a variety of essays and dissertations on history, chronology, and antiquities, to the "Bibliotheque Germanique," the "Memoirs of the Berlin Academy," and the "Histoire Critique de la Republique des Lettres." His principal separate work, the result of labour and much erudition, was "Chronologie de l'Histoire sainte, et des Histoires étrangères qui la concernant, depuis la Sortie d'Egypte jusqu'a la Captivité de Babylon," Berlin, 1738, 2 vols. 4to. Moreri.

VIGNOLY, in *Geography*, a town of Naples, in Basilicata; 5 miles S.S.E. of Potenza.

VIGNORY, a town of France, in the department of the Upper Marne; 10 miles S. of Joinville.

VIGNOT, a town of France, in the department of the Meuse, on the Meuse; 17 miles E. of Bar le Duc. N. lat. 48° 46′. E. long. 5° 41′.

VIGNUOLA, or VIGNOLA, a town of Italy, in the department of the Panaro; 15 miles S.E. of Modena.

VIGNY, a town of France, in the department of the Seine and Oise; 8 miles W. of Pontoise.

VIGO, GIOVANNI DA, in *Biography*, an eminent surgeon, born in Genoa, and in 1503 invited to Rome by pope Julius II. to be his first surgeon. He also received a considerable pension from the pope's nephew, cardinal della Rovere. His work, entitled "Practica in Arte Chirurgica copiosa," first published at Rome in 1514, folio, became very popular, and was often reprinted. It is a very full compendium of the art of surgery, (as then known and practised,) and contains also a system of anatomy and of materia medica, and was long regarded as a standard work. Another of his works, entitled "Chirurgia Compendiosa," 1517, is a kind of summary of the former, and some new observations. Haller. Eloy.

VIGO, in *Geography*, a sea-port town of Spain, in the province of Galicia, situated on a bay of the Atlantic, defended by a fort on an eminence, but not capable of great resistance. It has also an old castle, and stands in a very fruitful country. In 1589, Vigo was plundered by sir Francis Drake. In 1702, the English and Dutch fleets forced their passage in, and made themselves masters of the Spanish plate-fleet, when just returned from America. In 1719,

1719, the English again took possession of the place, but relinquished it after raising contributions; 12 miles N.N.W. of Tuy. N. lat. 42° 14′. W. long. 8° 43′.

VIGOER, a town of Norway, in the province of Bergen; 25 miles E. of Bergen.

VIGOLO, a town of the duchy of Piacenza; 15 miles S. of Piacenza.

VIGOLZANO, a town of the duchy of Piacenza; 8 miles S. of Piacenza.

VIGONE, a town of France, in the department of the Po; 14 miles S.S.W. of Turin.

VIGORETZKOI, a town of Russia, in the government of Olonetz; 20 miles E. of Povenetz.

VIGOROSO, or VIGOROSAMENTE, in the *Italian Music*, is used to direct a performer to sing or play with vigour, strength, and firmness.

VIGTEN, in *Geography*, an island in the North sea, near the coast of Norway. N. lat. 64° 55′. E. long. 11° 10′.

VIGULONE, a town of the duchy of Parma; 15 miles S.S.W. of Parma.

VIHELY, a town of Hungary; 10 miles N.E. of Patak.

VIHIERS, a town of France, and principal place of a district, in the department of the Mayne and Loire; 20 miles S. of Angers. N. lat. 47° 9′. W. long. 27′.

VIJAR, a town of Spain, in the province of Grenada; 13 miles N.E. of Almeria.

VIJAYA, in *Hindoo Mythology*, is the name of a granddaughter of Brahma, her father being Daksha. The name Vijaya, like Sarvajaya, means *victorious* or *all-conquering*, and is given to Parvati in some of her martial characters. In some books it is related, that in the process of churning the ocean, as described in our article KURMAVATARA, a flower or plant was produced, called Vijaya, or ever victorious, which Siva kept for his own use.

UJIBO, in *Geography*, a town of South America, in the jurisdiction of Guayaquil.

VIKA, a town of Sweden, in Dalecarlia; 6 miles S.E. of Fahlun.

VIKRAMA, or VIKRAMADITYA, in *Biography*, a celebrated astronomer and legislator of the Hindoos. The era named after him, corrupted into Bickermajit or Beekermajeet, is in very extensive use in the East, both among Hindoos and Mahometans; though the latter, of course, generally among themselves adopt that of the Hegira. In the ninth volume of the Asiatic Researches is a learned essay by Mr. Wilford on the era named after this celebrated astronomer, who was a monarch also. His capital was *Ougein*, under which article we have given some account of that very interesting city, and some notice of its royal patron, and his era.

VILAINE, in *Geography*, a river of France, which rises near Ernée, in the department of the Mayenne, passes by Vitré, Châteaubourg, Rennes, Redon, Rieux, la Roche Bernard, &c. and runs into the Atlantic, 9 miles below the last town.

VILAINES, a town of France, in the department of the Côte d'Or; 8 miles S. of Châtillon sur Seine.

VILAR *de Belle*, a town of France, in the department of the Aude; 12 miles S. of Carcassonne.

VILASAR, a town of Spain, on the south coast of Catalonia; 2 miles W. of Matara.

VILASK, a town of Hungary; 8 miles N. of Libeten.

VILBEL, a town of Germany, in the county of Hanau-Munzenourg, on the Nidda; 4 miles N. of Franckfort on the Maine.

VILBESTRE, a town of Spain, in the province of Leon; 43 miles S. of Salamanca.

VILCABAMBA, a town of Peru, in the diocese of Cusco; 60 miles N.N.W. of Cusco.—Also, a town of Peru; 70 miles S.S.E. of Cusco.—Also, a town of South America, in the province of Quito; 15 miles S. of Loxa.

VILCAS CUAMAN, or BILCAS, a town of Peru, and principal place of a jurisdiction of the same name, in the bishopric of Guamanga. The air is temperate, and the soil produces corn and fruit, and feeds abundance of cattle. The Indians are industrious, and employed in manufactures of different kinds of stuff.

VILEMERITZ, a town of Croatia; 6 miles S. of Sluin.

VILEPATTY, a town of the island of Ceylon; 12 miles W.N.W. of Trinkamaly.

VILEVO, a town of Sclavonia; 34 miles N.W. of Eszek.

VILFA, in *Botany*, an arbitrary name of Adanson's, in his Fam. des Plantes, v. 2. 495, adopted by Mr. Kunth, in Humboldt's Nov. Gen. et Sp. Pl. v. 1. 137. We cannot account for this adoption, there being nothing to recommend the name. Happily the genus which it designates is Mr. Brown's SPOROBOLUS. See that article.

VILILLA, in *Geography*, a town of Spain, in the province of Aragon, on the left side of the Ebro; 27 miles S.E. of Saragossa.

VILKIOT, a town of Sweden, in the province of Smaland; 23 miles N.W. of Calmar.

VILL, VILLA. See VILLAGE.

VILLA, a town of Etruria; 13 miles S.S.E. of Pontremoli.—Also, a town of South America, in the province of Paraguay; 90 miles E. of Assumption.—Also, a small island in the Atlantic, near the coast of Brasil. S. lat. 20° 9′.

VILLA, *La*, a town of New Grenada, on the Madalena; 16 miles N. of Neyba.—Also, a town of Mexico, in the province of Veragua, situated on the river Veragua, with a harbour fit to receive vessels of forty tons.

VILLA *Bella*, a town of Brasil, in the government of Matto Grosso.

VILLA *Boa*, a town of Brasil, and capital of the government of Goyas; 450 miles N.W. of Rio Janeiro. S. lat. 17°. W. long. 51° 24′.

VILLA *Boim*, a town of Portugal, in Alentejo; 4 miles S.W. of Elvas.

VILLA *Bona*, a town of Spain, in Guipuscoa, on the Orio; 6 miles from Tolosa.

VILLA *de Carmo*, a town of Brasil, in the government of Minas Geraes; 20 miles E.N.E. of Villa Rica. S. lat. 20° 20′. W. long. 44° 30′.

VILLA *Cham*, a town of Portugal, in the province of Beira; 11 miles E. of Coimbra.

VILLA *Chan*, a town of Portugal, in the province of Entre Duero e Minho; 5 miles N.W. of Barcelos.

VILLA *Clara*, a town of the island of Cuba; 20 miles N.W. of Spiritu Santo.

VILLA *de Conde*, a sea-port town of Portugal, in the province of Entre Duero e Minho, situated on the N. side of the river Aue; 9 miles E.S.E. of Barcelos. N. lat. 41° 23′. E. long. 8° 21′.

VILLA *Diego*, a town of Spain, in Old Castile, on the Pisuerga; 8 miles N.N.W. of Burgos.

VILLA *Fallet*, a town of France, in the department of the Stura; 5 miles N.N.W. of Coni.

VILLA *Faustini*, in *Ancient Geography*, a town of Great Britain, in the fifth Iter of the route of Antonine, between Colonia

Colonia or Colchester, and Icianos or Chesterford. This station is placed by Camden, Gale, and Baxter, at St. Edmund's Bury, in Suffolk; but Mr. Horsley prefers those copies of the Itinerary which have xxv for the numerals, and fixes it at Dunmow. Wherever it was situated, it probably derived its name from some great Roman called Faustinus having a country seat there.

VILLA *Fernanda*, in *Geography*, a town of Portugal, in Alentejo; 14 miles E. of Estremoz.

VILLA *Flor*, a town of Portugal, in the province of Tra los Montes; 12 miles S.E. of Mirandela.—Also, a town of Portugal, in the province of Alentejo; 7 miles N.N.W. of O Crato.

VILLA *de Frades*, a town of Portugal, in the province of Alentejo; 4 miles N. of Beja.

VILLA *Franca*, a town of Italy, in the department of the Benaco; 13 miles N. of Mantua.—Also, a town of Spain, in the province of Cordova; 13 miles N.E. of Cordova.—Also, a town of Spain, in Old Castile, on the Tormes; 25 miles S. of Avila.—Also, a town of Spain, in Old Castile; 9 miles S. of Frias.—Also, a town of Spain, in Old Castile; 10 miles E. of Burgos.—Also, a sea-port, and capital of St. Michael, one of the Azores islands. It is the most ancient town in the whole island; and so called from its being at first a free port. Before its harbour lies an island, about a mile in circumference, and towards the sea the town is defended by a fort and some other works. It consists of 1813 hearths, has two parish churches and two convents.—Also, a town of Spain, in the province of Leon; 12 miles N.W. of Ponferrada.—Also, a town of Spain, in the province of Leon; 35 miles W. of Astorga.—Also, a town of Italy, in the Trevisan; 14 miles W. of Trevigio.—Also, a town of France, in the department of the Dora; 3 miles S.E. of Aosta.—Also, a town of France, in the department of the Po; 16 miles S.S.W. of Turin.—Also, a sea-port town of France, in the department of the Maritime Alps, late the county of Nice, with two castles. The harbour is sheltered by some lofty hills, founded in 1295 by Charles II. king of Naples, who was earl of Provence: the citadel was built by duke Emanuel Philibert; 3 miles E. of Nice.

VILLA *Franca de Panades*, a town of Spain, in Catalonia, and principal place of a viguery; 20 miles S.W. of Barcelona.

VILLA *Franca de Xira*, a town of Portugal, in Estremadura, on the N. side of the Tagus; 15 miles N.E. of Lisbon.

VILLA *Frechos*, a town of Spain, in the province of Leon; 7 miles W.N.W. of Rioseco.

VILLA *Gaba*, a town of Brasil, in the government of St. Paul; 95 miles N.N.E. of St. Paul. S. lat. 22° 15′. W. long. 46° 6′.

VILLA *Garcia*, a town of Spain, in Estremadura; 4 miles N. of Llerena.

VILLA *Harta*, a town of Spain, in New Castile, on the left side of the Guadiana; 36 miles W. of Civdad Real.

VILLA *Hermosa*, or *Dilla de Mosa*, a town of Mexico, in the province of Tabasco, on a river navigable by boats to Tabasco; chiefly inhabited by Indians; 56 miles S.W. of Tabasco. N. lat. 17° 40′. W. long. 94° 16′.

VILLA *Hermosa*, a town of Spain, in New Castile; 15 miles W.S.W. of Alcaraz.—Also, a town of Spain, in the province of Valencia; 24 miles N. of Segorbe.

VILLA *de Horta*, the chief town of Fayal, one of the Azores islands. It is situated in the bottom of the bay of Fayal, or De Horta, close to the edge of the sea, and is defended by two castles, one at each end of the town, and a wall of stone-work, extending along the sea-shore, from the one to the other. But these works are in a state of decay, and seem more for show than strength. They brighten the prospect of the city, which makes a fine appearance from the road; and if we except the Jesuits' college, the monasteries, and churches, there is not another building that has any thing to recommend it, within or without. There is not a glass window in the place, except those of the churches, and in a country-house which lately belonged to the English consul; all the others being latticed, which to an Englishman has the aspect of prisons. This little city is crowded with religious buildings; it has three convents of men, and two of women, and eight churches. The Jesuits' college is a fine structure, and is seated on an eminence in the pleasantest part of the city. Since the expulsion of that order it is sinking into decay, and will probably soon be completely ruined. The Fayal wine, as it is called, is raised on the island Pico, and shipped abroad from De Horta, chiefly to America; from which circumstance it derives its name. Its bay or road of Fayal is situated at the E. end of the isle before the Villa de Horta, and facing the W. end of Pico. It is two miles broad, three-quarters of a mile deep, and has a semicircular form. N. lat. 38° 31′ 55″. W. long. 28° 38′ 56″.

VILLA *d'Iglesias*, or *Villa di Glesia*, a town of the island of Sardinia, and see of a bishop, in 1513 united to Cagliari; 36 miles S.W. of Cagliari. N. lat. 39° 28′. E. long. 8° 42′.

VILLA *Imprenta*, a town of Italy, in the department of the Mincio, on the Tione; 9 miles E. of Mantua.

VILLA *Joiosa*, or *Joysa*, a town of Spain, in Valencia, on the coast of the Mediterranean; 18 miles N.N.E. of Alicant.

VILLA *de Laguna*, or *Lagoa*, a town of Brasil, in the jurisdiction of Rio de Janeiro.

VILLA *Magna*, or *Villa Privata*, in *Ancient Geography*, a place of Africa Propria, upon the route from Carthage to Alexandria, between Pontezita and Fisida Vicus. Anton. Itin.

VILLA *Magna*, in *Geography*, a town of Naples, in Abruzzo Citra; 51 miles S.E. of Civita di Chieti.

VILLA *Major*, a town of Spain, in Galicia, on the coast of the Atlantic; 27 miles S.W. of St. Jago.—Also, a town of Spain, in Aragon; 12 miles S. of Saragossa.

VILLA *Martin*, a town of Spain, in Seville; 12 miles N.E. of Arcos.—Also, a town of Spain, in Leon; 22 miles E. of Leon.

VILLA *Mayor*, a town of Spain, in Leon; 30 miles S. of Leon.

VILLA *de la Monclova*, or *Le Coagula*, a town of New Mexico, in the province of New Leon.

VILLA *Mosa*. See VILLA *Hermosa*.

VILLA *de Motta*, a town of Istria; 3 miles S. of Capo d'Istria.

VILLA *Nova*, a town of France, in the department of the Sesia; 3 miles S. of Vercelli.—Also, a town of France, in the department of the Dora; 4 miles W. of Aosta.

VILLA *Nova d'Alvio*, a town of Portugal, in Alentejo; 18 miles N. of Beja.

VILLA *Nova d'Anços*, a town of Portugal, in Estremadura; 5 miles S. of Montemor o Velho.

VILLA *Nova d'Asti*, a town of France, in the department of the Tanaro, so called because it was built by the inhabitants of Asti, from the ruins of some neighbouring villages; and when they understood the advantages of its situation, they surrounded it with walls, bastions, ramparts, deep fosses filled with water, half-moons, and other works.

 It

It has besides two ancient towers, and two churches; 11 miles E. of Turin.

VILLA *Nova de Barcarota*, a town of Spain, in Estremadura; 27 miles S. of Badajos.

VILLA *Nova da Cervera*, a town of Portugal, on the S. side of the Minho, near its mouth, in the province of Entre Duero e Minho; 27 miles N.N.W. of Braga. N. lat. 41° 55′. W. long. 8° 27′.

VILLA *Nova de Ficalbo*, a town of Portugal, in Alentejo, on the confines of Spain; 24 miles S.E. of Beja.

VILLA *Nova de Fossoa*, a town of Portugal, in the province of Beira; 12 miles S.E. of St. Joao da Pesqueira.

VILLA *Nova de Meya*, a town of Spain, in Catalonia; 13 miles N.N.E. of Balaguer.

VILLA *Nova de Milfontes*, a town of Portugal, in Alentejo; 11 miles S. of Sines.

VILLA *Nova de Moncarros*, a town of Portugal, in the province of Beira; 16 miles W. of Montemor o Velho.

VILLA *Nova de Portimao*, a sea-port town on the S. coast of Portugal, and province of Algarve. It is a fortified town, built in the year 1463, and contains about 500 mostly small and poor houses, surrounded by a high wall, beyond which is a small suburb, and is garrisoned by two companies. The river of Villanova flows close to the walls, is here considerably broad (next to the Guadiana, which is the largest in Algarvia), and discharges itself half a league from thence between high downs into the sea. The bar is dangerous, and the sand-banks shifting, so that the harbour cannot be very important; 9 miles E.N.E. of Lagos. N. lat. 37° 5′. W. long. 8° 28′.

VILLA *Nova de Porto*, a town of Portugal, in the province of Entre Duero e Minho, on the left side of the Duero, opposite Oporto, built in the year 1255, and containing about 3000 inhabitants.

VILLA *Nova del Principe*, a town of Brasil, in the jurisdiction of Bahia. N. lat. 17° 10′. W. long. 42° 34′.

VILLA *Nova del Rio*, a town of Spain, in the province of Seville, near the Guadalquivir; 18 miles N.N.E. of Seville.

VILLA *Nueva*, a town of Spain, in Catalonia, on the coast of the Mediterranean. It has no harbour, but a good road; 24 miles W. of Barcelona.—Also, a town of Spain, in Asturia; 43 miles W. of Oviedo.

VILLA *Nueva de Gallego*, a town of Spain, in Aragon, on the Gallego; 6 miles from Saragossa.

VILLA *Nueva de Jaro*, a town of Spain, in the province of Cordova; 27 miles N.N.E. of Cordova.

VILLA *Nueva de los Infantes*, a town of Spain, in Galicia; 12 miles S. of Orense.

VILLA *Nueva de la Serena*, a town of Spain, in Estremadura; 63 miles N. of Seville.

VILLA *Nuova*, a town of Istria; 9 miles E.S.E. of Umago.—Also, a town of the island of Sardinia; 10 miles S. of Algeri.—Also, a town of Italy, in the department of the Upper Po; 18 miles E. of Cremona.—Also, a town of the Popedom, in the marquisate of Ancona, on the coast of the Adriatic; 10 miles E. of Macerata.

VILLA *Obleda*, a town of Spain, in New Castile; 28 miles N. of Alcaraz.

VILLA *Ombrosa*, a town of Etruria; 14 miles E. of Florence.

VILLA *del Ovo*, a town of Brasil, in the jurisdiction of Matto Grosso.

VILLA *do Ponte Trappa*, a town of Portugal, in the province of Beira; 18 miles N.E. of Viseu.

VILLA *del Principe*, a town of the island of Cuba; 145 miles N.W. of St. Jago. N. lat. 21° 17′. W. long. 77° 45′.

VILLA *do Principe*, a town of Brasil, in the government of Minas Geraes; 360 miles N. of Rio Janeiro. This town is situated on the declivity of a lofty hill, the base of which is washed by a rivulet called Corvinha de quatro Vergtems. It was established as a comarco, or district, in the year 1730, when the gold-washings were most productive; though it dates its origin about fifteen years earlier, when the place was discovered by the Paulists, at the commencement of their migration from Villa Rica and the adjacent settlements. At present the town contains about 5000 inhabitants, most of whom are shop-keepers, and the rest artisans, farmers, miners, and labourers. As this town is situated very near the confines of the Diamond district, and on the high road leading to it, the passage of all persons thither is subject to the strictest regulations. The country round is very fine and open, being free from those impenetrable woods, which occur so frequently in other parts of the province. Its soil is in general very productive, and the climate mild and salubrious. N. lat. 17° 6′. W. long. 42° 44′.

VILLA *Real*, a town of Portugal, in the province of Algarve, built by Pombal, four leagues from Tavira. It is situated at the mouth of the Guadiana, which is here a broad and fine stream. It is built with perfect regularity, the streets in which are the handsomest houses being situated on the bank of the river, and the smaller houses at a greater distance. The pavement is good, and in the middle of the town is a handsome square, in which the town-house stands. But it is in a lamentable degree destitute of inhabitants, and without a company of soldiers, the place would be quite empty. Poverty every where appears, the adjacent country being very sandy, and the soil in many places consisting entirely of quicksand: the downs are planted with fig-trees. The entrance of the harbour is broad but not very deep. The town derives all its supplies, even of bread, from Ayamonte, the destruction of which was aimed at by the founder of this town.—Also, a town of Portugal, in the province of Tra los Montes, containing two churches, two hospitals, three convents, and about 2400 inhabitants; 9 miles N. of Lamego.—Also, a town of Spain, in the province of Valencia; 20 miles E. of Segorbe.—Also, a town of Spain, in Guipuscoa; 6 miles S.S.W. of Placentia.

VILLA *Real de Conceiçaõ*, a town of Brasil, in the government of Minaes Geraes; 40 miles N.W. of Villa Rica.

VILLA *del Rey*, a town of Spain, in Estremadura, on the borders of Portugal, taken by the allies in the year 1706; 12 miles N. of Badajoz.—Also, a town of Spain, in Galicia; 22 miles S.E. of Orense.

VILLA *de la Reyna*, a town of Spain, in Estremadura; 12 miles E. of Llerena.

VILLA *Rica*, a town of Brasil, and capital of the jurisdiction of Minaes Geraes; 150 miles N. of Rio Janeiro. S. lat. 20° 25′. W. long. 44° 36′. The town stands on a steep and lofty eminence, connected with others forming an immense chain, of which it is one of the highest. Most of the streets, irregular and badly paved, range in steeps from the base to the summit, and are crossed by others which lead up the acclivity; but its environs exhibit few traces of cultivation. This town has been denominated the rich village; it is the capital of the province and the seat of its government, and has for many years been reputed the richest in Brasil, as it was the depository of all the gold found in the extensive surrounding district. This town is admirably supplied with water, which is conducted in a very convenient manner into almost every house; and in the streets are many fountains that are well constructed. One cistern contains water having a strong

ftrong tafte of fulphate of iron, which the natives confider as ferviceable in the cure of cutaneous difeafes, and in which they often bathe.

The town is divided into two parifhes, and contains a population of about 20,000 inhabitants, of whom there are more whites than blacks. The climate is delightful, and fuppofed to be equal to that of Naples; and though the latitude is only 20° 3', yet on account of its elevated fituation, the temperature of the air is generally moderate. The thermometer never exceeds 82° in the fhade, and is rarely below 48°; but its ufual range is from 64° to 80° in fummer, and from 48° to 70° in winter. The greateft heats prevail in January. Here are frequent fhowers of rain, and thunderftorms are common, but not violent. The fun is fometimes clouded by dews and mift fo denfe, as not to fubfide until the forenoon is far advanced. The gardens in the vicinity of the town are laid out with great tafte, and prefent a curious fpectacle, by their arrangement on the declivity of the mountain. They furnifh an ample fupply of vegetables of every kind, as artichokes, afparagus, fpinach, cabbage, kidney-beans, and potatoes. The peach, which is the only exotic fruit hitherto introduced, flourifhes in an aftonifhing degree.

The town is of confiderable extent, but not fo well peopled as when the mines were rich. The fhop-keepers are a numerous clafs, and they are plentifully fupplied with all forts of Englifh merchandize, except earthenware, hams, porter, and butter, which articles are dear. The market is ill fupplied, notwithftanding the fertility of the furrounding diftrict. Poultry might be had at a moderate price, from 3*s.* 6*d.* to 4*s.* 6*d.* *per* couple; beef was tolerable; pork very fine; but mutton utterly unknown. When Mr. Mawe vifited this town in the year 1809, fome of the inhabitants told him that it ought now to be termed "Villa Pobra," inftead of "Villa Rica." Of above 2000 habitations which the town contained, a confiderable proportion were untenanted, and the rents of the reft were continually lowering.

The mountain on which the town ftands appeared to be eight or nine miles in length, narrow and almoft infulated, being furrounded by deep ravines. It is compofed of argillaceous fchiftus in almoft every gradation, migrating from the compact blue flate into micaceous fchiftus. The firft difcovery of this once rich mountain was owing to the enterprifing fpirit of the Paulifts, who, of all the colonies in Brafil, retained the largeft portion of that ardent and indefatigable zeal for difcovery which characterized the Lufitanians of former days. They penetrated from their capital, St. Paul's, through impervious woods, and difputed every inch of their progrefs with the barbarous Indians. Following the courfe of rivers, they occafionally found gold; till arriving at this mountain, its riches arrefted their progrefs, and erecting temporary houfes, they began their operations. They were foon joined by other adventurers from St. Paul's and other places. Their wealth proved the occafion of contefts between the firft fettlers and new adventurers. When tranquillity was re-eftablifhed, a regular town began to be formed in 1711, and a code of laws enacted for the regulation of the mines. A fifth in weight of the gold-duft that was found was taken for the king, and the remainder purified, fmelted into ingots at the expence of government, then affayed, marked according to their value, and delivered to the owners, with a certificate to render them earneft: and for the convenience of trade, gold-duft was allowed to circulate for fmall payments. Smuggling, however, gained ground, and new regulations and provifions were adopted for reftraining it. Villa Rica foon enjoyed a confiderable trade with Rio de Janeiro: the returns were negroes, iron, woollens, falt, provifions of various kinds, and wine, which then bore very high profits. About the year 1713, the royal fifth amounted to half a million fterling annually. Antonio Dias, the leader of the Paulifts, who difcovered this fource of wealth, and became very rich, built a fine church, and at his death endowed it with confiderable funds: it ftill bears his name: five or fix others were begun and foon finifhed. The town alfo underwent many improvements; its ftreets were more regularly built, and the fide of the mountain levelled for the fcite of new houfes and gardens; refervoirs and fountains of water were conftructed in different parts; and the mint and fmelting-houfes were enlarged. The number of inhabitants at this time amounted to 12,000, or upwards. Between the year 1730 and 1750, the mines were in the height of their profperity; the king's fifth, as it is faid, amounting to at leaft a million fterling.

At the prefent day, Villa Rica fcarcely retains a fhadow of its former fplendour. Its inhabitants are unemployed, and the culture of the adjacent country neglected. Almoft every trade is now occupied either by mulattoes or negroes, both of which claffes feem fuperior in intellect to their mafters, becaufe they make a better ufe of it. However, the vicinity furnifhes the means of acquiring wealth by its mines of gold, iron, and porcelain clay, &c. if the inhabitants had underftanding or application to convert them into real value.

At the diftance of eight miles from Villa Rica is Mariana, feparated from it by a tremendous and almoft impaffable road, along a ridge of mountains. The Rio del Carmen runs through this town. This was made a bifhop's fee about the year 1715, and called Cidade de Mariana, in honour of the then reigning queen of Portugal. This is a fmall, neat, well-built town, containing from 6000 to 7000 inhabitants. It has a college for the education of young men defigned for the church. This place has little trade, and depends chiefly on the mines and feams in its vicinity. Mawe's Travels.

VILLA *Rica*, a town of South America, in the province of Paraguay; 100 miles N.E. of Affumption.—Alfo, a town of Chili; 60 miles N.E. of Valdivia. S. lat. 38° 50'. W. long. 73° 10'.

VILLA *Rodrigo*, a town of Spain, in the province of Leon; 40 miles E. of Leon.

VILLA *Rubia*, a town of Spain, in New Caftile; 6 miles E. of Ocana.

VILLA *Rubia de los Ojos*, a town of Spain, in New Caftile; 12 miles N. of Calatrava.

VILLA *de los Santos*. See SANTOS.

VILLA *de Sapra*, a town of Italy, in Friuli; 15 miles W. of Gemona.

VILLA *Savary, La*, a town of France, in the department of the Aude; 14 miles W. of Carcaffonne.

VILLA *de Sul*, a town of Portugal, in the province of Beira; 5 miles W. of Vifeu.

VILLA *del Valle*, a town of South America, in the province of Chiquitos.

VILLA *de Valle Fertile*, a town of South America, in the province of Cuyo; 80 miles S.E. of Juan de la Frontera.

VILLA *Vecchia*, a town of the Ligurian Republic; 12 miles N. of Genoa.

VILLA *Veja*, a town of South America, in the government of Bahia, at firft called St. Salvador.

VILLA *Vella de Rodao*, a town of Portugal, in Eftremadura; 17 miles S.S.W. of Caftel Branco.

VILLA *Vicento*, a town of Spain, in the province of Leon; 30 miles S. of Leon.

VILLA *Viçofa*, or *Villa Vizoça*, or *Villa Viciofa*, a town of

of Portugal, in Alentejo, containing two parish churches, eight convents, and about 3700 inhabitants. In the neighbourhood is dug some beautiful green marble. Near it is a royal palace, with a park; 97 miles N.E. of Evora. N. lat. 38° 39′. W. long. 7° 12′.

VILLA *Viciosa*, a town of Spain, in the province of Cordova; 25 miles N.N.W. of Cordova.—Also, a town of South America, in the province of Quito; 10 miles S.E. of Quito.—Also, a sea-port town of Spain, in the province of Asturias, situated at the bottom of a bay of the Atlantic; 30 miles N.E. of Oviedo.

VILLA *Vieja*, a town of Spain, in Old Castile; 34 miles E. of Burgos.

VILLA *Regis*, or *Regia*, a title anciently given to those villages where the kings of England had a royal seat, and held the manor in their own demesne; having there commonly a free chapel exempt from the bishop's jurisdiction.

VILLABAR, in *Geography*, a town of Portugal, in the province of Tras os Montes; 15 miles S.E. of Mirandela.

VILLACANAS, a town of Spain, in New Castile; 32 miles E.S.E. of Toledo.

VILLACASTIN, a town of Spain, in Old Castile; 18 miles W.S.W. of Segovia.

VILLACERF, a town of France, in the department of the Aude; 8 miles N.W. of Troyes.

VILLACH, a town of the duchy of Carinthia, on the right side of the Drave. Near the town are some medicinal baths; 18 miles W. of Clagenfurt. N. lat. 46° 43′. E. long. 13° 39′.

VILLACO, a town of the island of Corsica, in the district of Corte.

VILLACURI, a town of Peru, in the audience of Lima; 12 miles E.S.E. of Pisco.

VILLADA, a town of Spain, in the province of Leon; 27 miles N.W. of Palencia.

VILLÆ PREPOSITUS. See PREPOSITUS.

VILLAFAFILA, in *Geography*, a town of Spain, in the province of Leon; 20 miles N.N.E. of Zamora.

VILLAFELICHE, a town of Spain, in the kingdom of Aragon; 3 miles N. of Daroca.

VILLAFREDDA, a town of Naples, in Lavora; 9 miles N.N.W. of Sezza.

VILLAFRIA, a town of Spain, in Guipuscoa; 12 miles E.S.E. of Trevigno.

VILLAGE, VILLA, or *Vill*, an assemblage of houses, inhabited chiefly by peasants and farmers, having usually a church, but no market.

The word is French, formed of *vil*, or *vilis*, *low*, *mean*, *contemptible:* or rather, from the Latin *villa*, a *country-house*, or *farm*.

The want of a market distinguishes a *village* from a *town*, as the church does from a *green*, *street*, &c. Among our Saxon ancestors, *vill*, or *village*, was used in the sense of the Roman *villa; viz.* for a country farm, or seat, furnished with convenient outhouses, &c. for repositing the fruits thereof. Afterwards it came to be taken for a manor; and then for part of a parish, or the parish itself.

Hence, in several ancient law-books, *vill* and *parish* are the same thing: accordingly, Fortescue de Laudibus Leg. Ang. writes, "That the boundaries of villages are not by houses, streets, or walls; but by a large circuit of ground, within which may be divers hamlets, waters, woods, &c."

Fleta makes this difference between a *mansion*, a *village* and a *manor;* that a mansion may consist of one, or more houses; though there is only to be one dwelling-place, without any other very near it: for if other houses be contiguous, it is then a village. A manor may consist of one or more villages.

For the better government of villages, the lord of the soil has usually a power to hold a court-baron every three weeks.

The statute of Exeter, 14 Edw. I., makes frequent mention of entire-vills, demi-vills, and hamlets.

Entire-vills, sir H. Spelman conjectures to have consisted of ten freemen, or frank-pledges, demi-vills of five, and hamlets of less than five. See TOWN.

VILLAGE *Bay*, in *Geography*, a bay on the west coast of Africa. S. lat. 14° 25′.

VILLAGRA, a town of Spain, in the province of Leon; 17 miles N. of Rio Seco.

VILLAIN, or VILLEIN, *Villanus*, in our *Ancient Customs*, the same with *bondman:* called also, in Domesday-book, *servus*, *slave*.

A villain was one who held lands in *villenage*, or on condition of rendering base services to his lord.

Under the Saxon government, there was, as sir William Temple speaks, a sort of people in condition of downright servitude, employed in the most servile works, and belonging, they, their children and effects, to the lord of the soil, like the rest of the cattle or stock upon it. These seem to have been those who held what was called the *folk-land*, from which they were removeable at the lord's pleasure. On the arrival of the Normans here, it seems not improbable, that they, who were strangers to any other than the feodal state, might give some sparks of enfranchisement to such wretched persons as fell to their share, by admitting them, as well as others, to the oath of fealty, which conferred a right of protection, and raised the tenant to a kind of state superior to downright slavery, but inferior to every other condition. This they called *villenage*, and the tenants *villains*, either from the word *vilis*, or else, as sir Edward Coke tells us, *à villa*, because they lived chiefly in villages, and were employed in rustic works of the most sordid kind: hence they were also denominated *pagenses* and *rustici*. These villains, belonging principally to lords of manors, were either villains *regardant*, by the civilians called *glebæ addicti* or *ascriptitii*, that is, annexed to the manor or land; or else they were *in gross*, or at large, that is, annexed to the person of the lord, and transferrable from one owner to another. They could not leave their lord without his permission; but if they ran away, or were purloined from him, might be claimed and recovered by action, like beasts or other chattels. They held indeed small portions of land by way of sustaining themselves and families; but it was at the mere will of the lord, who might dispossess them whenever he pleased; and it was upon villain services, that is, to carry out dung, to hedge and ditch the lord's demesnes, and any other the meanest offices; and their services were not only base, but uncertain both as to time and quantity. A villain could acquire no property either in lands or goods; but if he purchased either, the lord might enter upon them, oust the villain, and seize them to his own use, unless he contrived to dispose of them again before the lord had seized them; for the lord had then lost his opportunity. In many places also, a fine was payable to the lord, if the villain presumed to marry his daughter to any one without leave from the lord; and by the common law, the lord also might bring an action against the husband for damages in thus purloining his property. For the children of villains were also in the same state of bondage with their parents; whence they are called in Latin *nativi*, whence the female appellation of a villain, who was called a *neife*. In case of a marriage between a freeman and a neife, or a villain and a free-woman, the

the issue followed the condition of the father, being free if he was free, and villain if he was villain; but no bastard could be born a villain. The law, however, protected the persons of villains, as the king's subjects, against atrocious injuries of the lord; for he might not kill, or maim his villain; though he might beat him with impunity, since the villain had no action or remedy at law against his lord, but in case of the murder of his ancestor, or the maiming of his own person. Neifes indeed had also an appeal of rape, in case the lord violated them by force.

Villains might be enfranchised by manumission. Hence, and by other means, they gained in process of time considerable ground on their lords; and in particular strengthened the tenure of their estates to that degree, that they came to have in them an interest in many places full as good, in others better than their lords. For the good-nature and benevolence of many lords of manors having, time out of mind, permitted their villains, and their children, to enjoy their possessions without interruption, in a regular course of descent, the common law gave them title to prescribe against their lords; and, on performance of the same services, to hold their lands, in spite of any determination of the lord's will. For though, in general, they are said to hold their estates at the will of the lord; yet it is such a will as is agreeable to the customs of the manor; which customs are preserved and evidenced by the rolls of the several courts-baron in which they are entered, or kept on foot by the constant immemorial usage of the several manors in which the lands lie. And, as such tenants had nothing to shew for their estates but these customs, and admissions in pursuance of them, entered on those rolls, or the copies of such entries witnessed by the steward, they now began to be called *tenants by copy of a court-roll*, and their tenure itself a *copyhold*. Copy-holders are, therefore, in truth no other but villains, who, by a long series of immemorial encroachments on the lord, have at last established a customary right to those estates, which were before held absolutely at the lord's will. These encroachments at length became so universal, that when tenure in villenage was virtually abolished (though copy-holds were reserved) by the statute of Charles II. there was hardly a *pure* villain left in the nation. To this purpose sir Thomas Smith testifies, that in all his time (and he was secretary to Edward VI.) he never knew any villain in gross throughout the realm; and the few villains regardant that were then remaining, were such only as had belonged to bishops, monasteries, and other ecclesiastical corporations, in the preceding times of popery. By several means, the generality of villains in the kingdom have long ago sprouted up into copy-holders; their persons being enfranchised by manumission, or long acquiescence; but their estates, in strictness, remaining subject to the same servile conditions and forfeitures as before; though, in general, the villain services are usually commuted for a small pecuniary quit-rent. Blackst. Com. book ii. See VILLENAGE.

VILLAIN *Estate*, or *Condition*, is contradistinguished to *free estate*. See BASE *Tenure*, and VILLENAGE.

VILLAINAGE. See VILLENAGE.

VILLAINE, in *Geography*, a town of France, and principal place of a district, in the department of the Mayenne; 12 miles E.N.E. of Mayenne. N. lat. 48° 21′. W. long. 0° 11′.

VILLAINOUS JUDGMENT, is that which casts the reproach and stain of villainy and shame on him against whom it is given. As that against a conspirator, &c. See CONSPIRACY.

Lambard calls it *villainous punishment;* and says, it may well be called *villainous*, in regard the judgment, in such case, shall be like the ancient judgment in attaint, viz. that the criminals shall not be of any credit afterwards: nor shall it be lawful for them, in person, to approach the king's court: that their lands and goods shall be seized into the king's hands, their trees rooted up, their bodies imprisoned, &c.

This villainous judgment is now become obsolete; it not having been pronounced for some ages: but instead of it, the delinquents are usually sentenced to imprisonment, fine, and pillory.

VILLALAR, in *Geography*, a town of Spain, in the province of Leon; 12 miles N.N.W. of Rio Seco.

VILLALBA, a town of Spain, in Estremadura; 32 miles S.E. of Badajoz.—Also, a town of Spain, in Galicia; 18 miles S.W. of Mondonedo.

VILLALON, a town of Spain, in the province of Leon; 25 miles W.N.W. of Palencia.

VILLALPANDA, JOHN-BAPTIST, in *Biography*, a native of Cordova, entered the society of Jesus in 1571, and distinguished himself by a learned and diffuse commentary on the book of Ezekiel, in three vols. fol. Rome, 1596. It contains an elaborate description of the city and temple of Jerusalem. He also published, in 1598, "Explanatio Epistolarum Sancti Pauli," under the name of Remi of Rheims, to whom he found it ascribed in a manuscript dated in 1067. This Jesuit died in 1608. Dupin.

VILLALPANDO, in *Geography*, a town of Spain, in the province of Leon; 33 miles S. of Leon.

VILLALTA, a town of Italy, in the country of Friuli; 5 miles W. of Udina.

VILLALVA, a town of Spain, in Galicia; 15 miles S. of Mondonedo.

VILLAMBEA, a town of Spain, in New Castile; 25 miles S.S.E. of Madrid.

VILLAMEA, a town of Portugal, in the province of Beira; 4 miles S. of Lamego.

VILLAMEDO, a town of Spain, in Estremadura; 12 miles W.S.W. of Talavera la Vieja.

VILLAMENA *de la Jarra*, a town of Spain, in the province of Cordova; 27 miles N.N.E. of Cordova.

VILLAMIEL, a town of Spain, in the province of Leon; 43 miles S. of Ciudad Rodrigo.

VILLANDRAUT, or VILLANDRADE, a town of France, in the department of the Gironde; 8 miles W.N.W. of Bazas.

VILLANDRY, a town of France, in the department of the Indre and Loire; 9 miles W.S.W. of Tours.

VILLANELLA, in *Italian Music*, rustic airs that were sung about the streets of Naples in the 16th century, in three and four parts, as serenades. They are sometimes called *villotte* and *villanesche alla Napolitana*.

VILLANI, GIOVANNI, in *Biography*, a native of Florence, was old enough in 1300 to visit Rome at the jubilee, and is supposed to have afterwards travelled into France and Flanders. In 1316 and 1317 he was one of the magistrates called priors at Florence, and also in the latter year official of the mint, to whom was due an exact register, still extant, of all the money coined at Florence in and before his time. He served in the Florentine army in 1323, and in 1328 contrived means for relieving his poor countrymen at a period of distressing scarcity. On occasion of the failure of the company of Bonaccorsi, in which he had a share, in 1345, and to which he was not accessory, he was committed to the public prison, and his life was terminated by the plague, which severely visited Florence in 1348. Villani bears the character of one of the most polished writers of his age, and the most conversant in the history of his country. His

History

Hiſtory records, in twelve books, the events occurring in Florence from its foundation till the year of his death, and comprehends alſo the principal changes that happened in the other Italian provinces. The early part of this Hiſtory abounds with errors and fables; but in deſcribing the occurrences of Tuſcany in his own time, he is deemed a ſafe guide, allowing for his partiality to the Guelph intereſt, and for his unacknowledged extracts from the Hiſtory of Ricordano Malaſpini. This Hiſtory, which has been always much eſteemed, both for its matter and the elegance of its ſtyle, was firſt printed by the Giunti of Florence in 1537, and the lateſt of ſeveral editions of it was that of Milan, in the collection of Italian hiſtorians. It was continued after his death by his brother, MATTEO VILLANI, who brought it down to 1363, in which year, whilſt he was writing the 11th book, he was carried off by the plague. His Hiſtory is not held in equal eſtimation with that of his brother, its ſtyle being too diffuſe; but he was contemporary with the events which he relates. Tiraboſchi. Gen. Biog.

VILLANI, FILIPPO, ſon of *Matteo*, was educated for the law, and was for many years chancellor to the municipality of Perugia. But he chiefly devoted himſelf to literary purſuits, and in 1404 delivered lectures on the Commedia of Dante. He added forty-two chapters to his father's Hiſtory of Florence, thus completing the 11th book. He alſo compoſed the "Lives of illuſtrious Florentines," originally written in Latin, but tranſlated into Italian, and publiſhed in 1747 by Mazzuchelli, with copious annotations. The firſt book of this work treated of the origin and antiquities of Florence. Tiraboſchi. Gen. Biog.

VILLANTERIA, in *Geography*, a town of Italy, in the department of the Upper Po; 9 miles S.W. of Lodi.

VILLAR, a town of France, in the department of Mont Blanc; 9 miles W. of Conflans.

VILLAR *Mayor*, a town of Portugal, in the province of Beira; 5 miles N. of Alfayates.

VILLAR *de Canas*, a town of Spain, in New Caſtile; 25 miles S. of Huete.

VILLAR *de Toro*, a town of Portugal, in the province of Beira; 10 miles N. of Alfayates.

VILLARA, a town of Spain, in the province of Biſcay; 13 miles S. of Bilbao.

VILLARCAYO, a town of Spain, in Old Caſtile; 12 miles N. of Frias.

VILLARD *de Lans*, *Le*, a town of France, in the department of the Iſere; 8 miles S.S.W. of Grenoble.

VILLARD *St. Pancrace*, a town of France, in the department of the Higher Alps; 3 miles S. of Briançon.

VILLAREJORUBIA, a town of Spain, in New Caſtile; 35 miles S.E. of Cuença.

VILLARESIA, in *Botany*, a genus named after Matthew Villares, a Spaniſh botaniſt, in the Flora Peruviana, p. 28, according to De Theis. We have no account of its characters.

VILLARET, CLAUDE DE, in *Biography*, was born at Paris in 1715, and liberally educated, but prevented, by the pernicious influence of youthful paſſions, from duly availing himſelf of his acquiſitions. After writing a novel and a piece for the theatre, he quitted Paris in 1748, and went upon the ſtage at Rouen, and other places. But renouncing this mode of life at Liege in 1756, he returned to Paris, and becoming firſt clerk in the chamber of accounts, he was reclaimed from his diſſipated courſe, and made himſelf acquainted with thoſe ſources of French hiſtory to which his office gave him acceſs. On the death of the abbé Velly in 1759, he was ſelected for continuing his Hiſtory; and at the ſame time was made ſecretary to the peerage. His early imprudence and his ſubſequent application to buſineſs terminated his life in 1766. His continuation of the "Hiſtoire de France" commences in the 8th volume, with the reign of Philip VI. and concludes in the 17th volume: it abounds with intereſting remarks and curious anecdotes, but the reader is diverted from the main object by prolixity of detail in prefaces and digreſſions. The ſtyle however is elegant and animated, but too rhetorical for the ſimplicity of hiſtory. Villaret was alſo the author of "Conſiderations ſur l'Art du Theatre," 1758; and "L'Eſprit de Voltaire," 1759. Nouv. Dict. Hiſt.

VILLARIA, in *Botany*, was intended by Schreber to commemorate the excellent author of the "Hiſtoire des Plantes de Dauphiné," M. Villars, formerly phyſician to the military hoſpital at Grenoble, who died profeſſor of botany at Straſburgh, two or three years ago, where his bier was elegantly decorated with wreaths of his own *Roſa rubrifolia*; ſee ROSA, n. 44. He publiſhed there, in 1807, a "Catalogue Méthodique du Jardin de l'Ecole de Médécine de Straſbourg," in French, according to Juſſieu's ſyſtem, with a hiſtorical, critical and practical preface. Villars was an excellent and indefatigable obſerver of nature, well worthy of commemoration, which makes us regret our total want of information reſpecting his genus, except the generic characters given by Schreber. As this author did not live to write a work on the ſpecies of plants, and has left no account of the native country, number of ſpecies, nor any other circumſtance in the hiſtory of his *Villaria*, the genus can never be properly adopted. We ſhall only here remark, that the name ought certainly to be VILLARSIA; ſee that article.—Claſs and order, *Dioecia Pentandria*. Nat. Ord. perhaps *Rhamni* or *Sapindi* of Juſſieu.

Gen. Ch. Male, *Cal.* Perianth of one leaf, in five deep, ſpreading, roundiſh, obtuſe, concave, coriaceous, nearly equal, ſegments, thinner at the margin, permanent; two of them interior. *Cor.* Petals five, oblong, obtuſe, flat, ſpreading, coriaceous, thinner at the margin, twice the length of the calyx, permanent. *Stam.* Filaments five, awl-ſhaped, erect, half as long as the calyx; anthers roundiſh, two-lobed. *Piſt.* Germen orbicular, depreſſed (we preſume imperfect); ſtyle very ſhort; ſtigma capitate.

Female, *Cal.* and *Cor.* as in the male. Nectary of five ovate, obtuſe, erect, permanent leaves, alternate with the petals, and not ſo long. *Piſt.* Germen turbinate, ſomewhat ovate; ſtyle very ſhort, ſcarcely any; ſtigma capitate, ſlightly three-cleft. *Peric.* Berry nearly globular, pointed with the permanent ſtyle, three-celled. *Seeds* ſolitary.

Obſ. This deſcription is materially defective, inaſmuch as there is no mention of the germen being inferior or ſuperior, nor indeed any uſeful information with regard to the reſpective inſertion of the parts; except the leaves of the nectary being alternate with the petals, which, if true, militates againſt our conjectures as to the natural order of this genus. Nevertheleſs, we ſhall attempt an eſſential character, in hopes that thoſe who have acceſs to the learned Schreber's herbarium, may diſcover, and communicate to the world, a complete hiſtory of the plant in queſtion.

Eſſ. Ch. Male, Calyx in five deep ſegments. Corolla of five petals. Nectary none. Germen orbicular, imperfect.

Female, Cal. and Pet. like the male. Nectary of five leaves, alternate with the petals. Style one. Berry of three cells. Seeds ſolitary.

VILLARINO, in *Geography*, a town of Spain, in the province of Leon, on the E. ſide of the Duero, and confines of Portugal; 38 miles W. of Salamanca.

VILLARLUENGO, a town of Spain, in Aragon; 21 miles S.W. of Alcaniz.

VILLAROYA, a town of Spain, in the kingdom of Aragon; 15 miles N.W. of Calataiud.

VILLARRAMIEL, a town of Spain, in the province of Leon; 16 miles W. of Palencia.

VILLARS, Louis-Hector, duke of, and marſhal of France, in *Biography*, was born at Moulins, in Bourbonnois, in 1653, and commenced a military life in his youth. He ſerved in Holland in 1672, ſignalized his courage at the ſiege of Maeſtricht in 1673, and was wounded at the battle of Senef in 1674. We cannot follow him through all his gradations of advancement and diſplays of military talents; but we find, at the famous battle of Blenheim, that he was deſtined by Lewis XIV. to check the progreſs of Marlborough. With an inferior army he kept the victors at bay, ſo that the campaign of 1705 paſſed off without any further loſs to France. After various other ſervices, in which he diſtinguiſhed himſelf, he was appointed to command in Flanders againſt the allies in 1709; and marching to the relief of Mons, he was attacked by Marlborough and Eugene at Malplaquet. The engagement was long and bloody, and though the French were driven from the field, the greateſt loſs of men was ſuſtained by the victors. To a wound which compelled Villars to withdraw from the field, he attributed the loſs of the battle. In reference to this gaſconade (as ſome would be diſpoſed to call it), Voltaire obſerves, "I know that the marſhal himſelf was perſuaded of it, but I alſo know, that few others were ſo." As a further reward for his ſervices, he was made a peer of France, and lieutenant-general of the biſhoprics of Metz and Verdun. Although France was relieved by the ſeparation of England from the alliance in 1712, Eugene produced conſternation at Paris by beſieging Landrecy with a ſuperior force. On this occaſion, Villars attacked a part of the allied army at Denain, which he entirely broke up, and this ſucceſs led to the recovery of all the places loſt by the French in that quarter, at the reſtoration of their ſuperiority. The peace of Utrecht followed; and the emperor having refuſed to be comprehended in it, marſhal Villars and Eugene held conferences at Radſtadt in 1714, for a treaty between their reſpective ſovereigns, which they conducted with the frankneſs of military men, and ſoon brought to a concluſion. Villars, who had experienced the attacks of envy and jealouſy at his own court, ſaid to Eugene on this occaſion: "Sir, we are not enemies; your enemies are at Vienna, and mine at Verſailles."

After the death of Lewis XIV., Villars for ſome time maintained his credit at court: being made preſident of the council of war in 1715, and one of the council of regency in 1718. But when Lewis's ſyſtem was in agitation, he thought it his duty to ſtate to the regent the evils which, in his apprehenſion, would reſult from it; and he thus contributed to the diſcharge of that financier, and to the appointment of his ſucceſſor. When the regency devolved upon the duke of Bourbon, Villars was always conſulted, who was then at the height of his fortune:—a marſhal of France, a duke and peer, governor of Provence, a grandee of Spain, a knight of the golden fleece, and a member of the council. What more was wanting to gratify ambition? When France was excluded from the treaty that was brought about by the intrigues of the principal courts of Europe between the emperor, Spain and England, a war broke out in 1733, and Villars, with the title of general of the camps and armies (dormant ſince Turenne), was ſent, at the age of eighty, to command in the Milaneſe. But though he met with ſome ſucceſs, age and infirmities would not allow him to make more than one campaign. On his return to France, he was ſeized with a diſorder that terminated his life at Turin. When his confeſſor obſerved to him, that God had favoured him with more time to prepare for death than marſhal Berwick, who had juſt been killed by a cannon-ball at the ſiege of Philipſburg, "What! (ſaid he) has he ended his life in that manner? I always ſaid that he was more fortunate than I." He ſoon after expired, in June 1734, in the eighty-firſt year of his age.

The character of Villars is thus delineated by one of his biographers. "Marſhal Villars was a true military genius, full of courage and confidence, who raiſed himſelf by perſiſting in always doing more than his duty. He was reproached with having leſs modeſty than valour, and with ſpeaking of himſelf as he had deſerved that others ſhould ſpeak of him. Nor was he ſparing of cenſures on others, and he employed rather defiance than conciliation towards his enemies. Though poſſeſſing integrity and lively parts, he was therefore never able to render himſelf popular, or to acquire friends. In action he was always preſent where the danger was greateſt; and he held it as a maxim, 'that a general ought to expoſe himſelf as much as he expoſes others.'" Villars was admitted into the French Academy in 1714. "Memoirs of the Marſhal de Villars" were printed in Holland, in three vols. 1734–36, the firſt of which alone was written by himſelf. A more intereſting publication appeared in 1784, entitled "La Vie du Maréchal de Villars, écrite par lui-même, et donnée au Public par M. Anquetil," four vols. 12mo. This work contains the letters, recollections, and journal of the marſhal, properly arranged by the editor. Moreri. Gen. Biog.

Villars de Montfaucon de, a relation of the celebrated father Montfaucon, was educated for the church, and came from Toulouſe to Paris in order to obtain diſtinction as a preacher. He was received into the beſt company, and made himſelf known by ſeveral works, eſpecially by his "Comte de Gabalis, ou Entretiens ſur les Sciences ſecretes," firſt printed at Paris in 1670. This work is a kind of joco-ſerious view of the Roſycrucian philoſophy, rendered amuſing as a romance. From this ſource Pope derived his machinery of the "Rape of the Lock." Villars, in conſequence of this work, which was thought to contain heretical notions, was forbidden the pulpit. He added to it a ſecond part, and it has been ſeveral times reprinted; the laſt time in 1742, two vols. 12mo. He was alſo the author of ſeveral other works. He was killed by a piſtol-ſhot, by one of his relations, on the road from Paris to Lyons, in 1675, when he was about thirty-five years of age. Bayle. Moreri.

Villars, in *Geography*, a town of France, in the department of the Ain; 8 miles S.E. of St. Trivier.

VILLARSIA, in *Botany*, a genus more correctly named, as to its orthography, than Villaria, (ſee that article,) but with reſpect to its diſtinctive character, we fear, leſs certain. It conſiſts of ſuch ſpecies of the Linnæan *Menyanthes*, as have the *corolla* only partially covered with hairs, and the margin of whoſe ſegments is thin, inflexed in the bud. The leaves moreover are ſimple, not ternate. Gmelin had long ago eſtabliſhed this ſame genus, in the Peterſburgh Tranſactions for 1769, by the name of *Limnanthemum;* and Wiggers in his Primitiæ Floræ Holſatiæ, p. 20, publiſhed in 1780, by that of *Waldſchmidia.* Yet in ſpite of theſe prior claims, Ventenat, in his Choix de Plantes, t. 9, has followed a more recent authority, if it may ſo be called, in naming theſe plants *Villarſia,* and he is followed by Mr. Brown, in his Prodr. Nov. Holl. v. 1. 456. The authority to which we allude is that of another Gmelin, late profeſſor at Gottingen, who in his compiled edition of Linnæus's Syſtema, took upon him to beſtow gratuitous appellations

appellations on numerous genera, which the modest unpretending Walter, in his Flora Caroliniana, had left for the future examination and decision of more experienced botanists. His *Anonymos*, n. 109, is the *Villarsia* of this professor Gmelin, in Linn. Syst. Nat. v. 2. 447; neither of these authors seeming to have the least idea of the plant being already described or named.—Notwithstanding what these writers have done, Mr. Dryander, in Ait. Hort. Kew. v. 1. 312, has followed the example of Linnæus, Jussieu, Schreber, Willdenow, and the writer of this in his Fl. Brit. and English Botany, in keeping all the species, which constitute *Villarsia*, in the genus Menyanthes; see that article. There we trust they may safely remain, and perhaps the above authorities may at least neutralize each other, with respect to botanical discrimination, as well as nomenclature. We must not omit that Mr. Pursh, in his Flora Amer. Sept. 139, has adopted the present *Villarsia*, but without throwing any new light upon its characters.

VILLARUM Nomina. See Nomina.

VILLASANDINO, in *Geography*, a town of Spain, in Old Castile; 20 miles N.W. of Burgos.

VILLASECA, a town of Spain, in Catalonia, on the coast of the Mediterranean; 6 miles W. of Tarragona.

VILLASIDRA, a town of the island of Sardinia; 10 miles N.E. of Villa d'Iglesias.

VILLATTE, a town of France, in the department of the Creuse; 10 miles N.W. of Gueret.

VILLAVANEZ, a town of Spain, in the province of Leon; 12 miles S. of Palencia.

VILLAYER Fertans, a town of France, in the department of the Doubs; 5 miles S.S.W. of Ornans.

VILLAZIM, a town of Portugal, in the province of Beira; 23 miles S.S.E. of Viseu.

VILLE, a town of France, in the department of the Lower Rhine; 8 miles N.W. of Schletstatt.—Also, a town of France, in the department of the Marne; 9 miles S.W. of Rheims.—Also, a town of France, in the department of the Marne; 9 miles N.N.W. of St. Menehould.

Ville *aux Clercs, La*, a town of France, in the department of the Loire and Cher; 24 miles N.W. of Blois.

Ville *Comtal*, a town of France, in the department of the Gers; 11 miles S.W. of Mirande.—Also, a town of France, in the department of the Aveiron; 18 miles W. of St. Genies de Rivedolt.

Ville *Franche*, a town of France, and principal place of a district, in the department of the Aveiron; 24 miles W. of Rhodez. N. lat. 44° 21′. E. long. 2° 7′.—Also, a town of France, in the department of the Lot and Garonne; 6 miles E. of Castel Jaloux.—Also, a town of France, and principal place of a district, in the department of the Upper Garonne, on the Garonne; 18 miles S.E. of Toulouse. N. lat. 43° 24′. E. long. 1° 49′.—Also, a town of France, and seat of a tribunal, in the department of the Rhône and Loire, on the right bank of the Rhône. It is surrounded with walls and ditches; 3½ posts N. of Lyons. N. lat. 46° 7′. E. long. 4° 48′.—Also, a town of France, in the department of the Allier; 15 miles S.W. of Moulins.—Also, a town of France, in the department of the Dordogne; 15 miles S.W. of Mucidan.

Ville *Franche d'Albigeois*, a town of France, in the department of the Tarn; 8 miles E.S.E. of Alby.

Ville *Franche d'Astarac*, a town of France, in the department of the Gers; 14 miles S. of Auch.

Ville *Franche de Conflans*, a town of France, in the department of the Eastern Pyrenées; defended by a fort, erected in the reign of Louis XIV.; 27 miles W.S.W. of Perpignan.

Ville *Franche de Panat*, a town of France, in the department of the Aveiron; 6 miles W. of Milhau.

Ville *Franche de Perigord*, a town of France, in the department of the Dordogne; 36 miles S.S.E. of Perigueux.

Ville *sur Illon*, a town of France, in the department of the Vosges; 9 miles W. of Epinal.

Ville *en Tardenois*, a town of France, in the department of the Marne; 10 miles S.W. of Rheims.

Ville *sur Tourbe*, a town of France, in the department of the Marne; 8 miles N.N.W. of St. Menehould.

Ville *Vaucance*, a town of France, in the department of the Ardêche; 14 miles N.N.W. of Tournon.

Ville *Vieu, La*, a town of France, in the department of the Vienne; 8 miles S. of Poitiers.

VILLEBERNIER, a town of France, in the department of the Mayne and Loire; 3 miles E. of Saumur.

VILLEBOIS, a town of France, in the department of the Ain; 6 miles S. of St. Rambert.

VILLEBOURG, or Ville Boureau, a town of France, in the department of the Indre and Loire; 18 miles N.N.W. of Tours.

VILLEBRUMIER, a town of France, in the department of the Upper Garonne; 15 miles S.E. of Castel Sarasin.

VILLECROSE, a town of France, in the department of the Var; 9 miles N.N.W. of Draguignan.

VILLEDIEU, a town of France, in the department of the Mayne and Loire; 9 miles N.W. of Chollet.—Also, a town of France, in the department of the Vienne; 12 miles S.S.E. of Poitiers.—Also, a town of France, in the department of the Loire and Cher; 18 miles W. of Vendôme.—Also, a town of France, in the department of the Channel; 8 miles N.N.E. of Avranches.

VILLEFAGNAN, a town of France, in the department of the Charente; 6 miles S.S.W. of Ruffec.

VILLEFLEUR, a town of France, in the department of the Lower Seine; 2 miles N. of Cany.

VILLEFORE, Joseph-François-Bourgoin de, in *Biography*, was born of a noble family at Paris in 1652, and liberally educated. In 1706 he was admitted a member of the Academy of Inscriptions; but withdrew from it in 1708, because he did not choose to perform its burdensome exercises. He passed the remainder of his life in the cloister of the metropolitan church, and died in 1737, at the age of 85. His historical and biographical works, the latter being chiefly religious, were numerous. He also made several translations from St. Augustine, St. Bernard, and Cicero, which are faithful, and occasionally elegant. He was likewise the author of some smaller pieces in classical literature. Moreri.

VILLEFORT, in *Geography*, a town of France, and principal place of a district, in the department of the Lozere; 20 miles E. of Mende. N. lat. 44° 27′. E. long. 3° 59′.

VILLEHARDOUIN, Geoffroi de, in *Biography*, was marshal of Champagne, an office held by his father and his descendants. He took a principal part in the fourth crusade of 1198, which produced the capture of Constantinople by the French and Venetians in 1204; and of this expedition he wrote or dictated a narrative, which is curious and interesting. The best edition is that of Du-Cange, fol. 1657, with many notes. Moreri.

VILLEIN Fleeces, in our *Statutes*, are bad fleeces of wool, shorn from scabby sheep. 31 Edw. III. cap. 8.

VILLEJUIF, in *Geography*, a town of France, in the department of Paris; 3 miles S. of Paris.

VILLEL, a town of Spain, in New Castile; 17 miles N.N.W.

N.N.W. of Molina.—Alſo, a town of Spain, in New Caſtile; 15 miles S. of Molina.

VILLELOIN, or VILLELOUP, a town of France, in the department of the Indre and Loire; 9 miles E.N.E. of Loches.

VILLEMAUR, a town of France, in the department of the Aube; 14 miles W.S.W. of Troyes.

VILLEMONTOIS, a town of France, in the department of the Rhône and Loire; 8 miles S.W. of Roanne.

VILLEMUR, a town of France, in the department of the Upper Garonne; 17 miles N. of Toulouſe.

VILLENA, a town of Spain, in the province of Murcia. In the neighbourhood is a moraſs, from which they manufacture ſalt; 41 miles N.N.E. of Murcia. N. lat. 38° 35′. W. long. 1° 2′.

VILLENAGE, or VILLAINAGE, *Villania*, the quality or condition of a *villain*; which ſee.

Villenage is more particularly uſed for a ſervile kind of tenure of lands or tenements; by which the tenant was bound to do all ſuch ſervices as the lord commanded, or were fit for a villain to perform: which Bracton expreſſes by "ſciri non poterit veſpere, quale ſervitium fieri debet mane."

Villenage is divided into that *by blood*, and that *by tenure*. Tenure, in villenage, could make no freeman a villain, unleſs it were continued time out of mind; nor could free land make a villain free.

Villenage is alſo divided, by Bracton, into *pure* villenage, where the ſervices to be performed were baſe in their nature, and indeterminate and arbitrary as to the time and quantity, as above expreſſed; from which ancient tenures have ſprung our preſent copyhold tenures: and *ſocage* or *privileged* villenage, where the ſervice was baſe in its nature, but reduced to a certainty: which was to carry the lord's dung into his fields, to plow his ground on certain days, to ſow and reap his corn, &c. and even to empty his jakes: as the inhabitants of Bicton were bound to do to the lord of Cluncaſtle, in Shropſhire; which was afterwards turned into a rent, now called *Bicton ſilver*; and the villainous ſervice excuſed.

This laſt ſpecies of villenage, ſays Bracton, is ſuch as has been held of the kings of England from the Conqueſt downwards; that the tenants herein *villana faciunt ſervitia, ſed certa & determinata*; that they cannot alien or transfer their tenements by grant or feoffment, any more than pure villains can; but muſt ſurrender them to the lord or his ſteward, to be again granted out and held in villenage. From theſe circumſtances, ſays judge Blackſtone, we may collect, that what he thus deſcribes is no other than an exalted ſpecies of copyhold ſubſiſting at this day, *viz.* the tenure in *ancient demeſne*: to which, as partaking of the baſeneſs of villenage in the nature of its ſervices, and the freedom of ſocage in their certainty, he has given the compound name of *villanum ſocagium*. This ancient demeſne, or demain, conſiſts of lands or manors, which, though now perhaps granted out to private ſubjects, were actually in the hands of the crown in the time of Edward the Confeſſor, or William the Conqueror; and ſo appear to have been by the great ſurvey called Domeſday-book. Some of the tenants of theſe lands continued for a long time pure and abſolute villains, dependent on the will of the lord; and thoſe who ſucceeded them in their tenures now differ from common copyholders in a few points. Others were in a great meaſure enfranchiſed by royal favour; being only bound in reſpect of their lands to perform ſome of the better ſort of villain ſervices, and thoſe determinate and certain; as, to plough the king's land, to ſupply his court with proviſions, and the like; all of which are now changed into pecuniary rents; and in conſideration of theſe they had many privileges and immunities granted to them; as to try the right of their property in a peculiar court of their own, called a court of ancient demeſne, by a peculiar proceſs, denominated a writ of *right cloſe*; not to pay toll or taxes; not to contribute to the expences of knights of the ſhire; not to be put on juries, and the like. Theſe tenants, though their tenure be abſolutely copyhold, have an intereſt equivalent to a freehold; for their ſervices were fixed, and they could not be compelled (like pure villains) to relinquiſh theſe tenements at the lord's will, or to hold them againſt their own; and *ideo*, ſays Bracton, *dicuntur liberi*. Britton alſo, from this their freedom, calls them abſolutely *ſokemans*, and their tenure, *ſokemanries*. The ſame name is alſo given them in Fleta. Lands holden by this tenure are a ſpecies of copyhold, and as ſuch, preſerved and exempted from the operation of the ſtatute of Charles II.; yet they differ from common copyholds, principally in the privileges before-mentioned: as alſo they differ from freeholds by one ſpecial mark and tincture of villenage, noted by Bracton, and remaining to this day, *viz.* that they cannot be conveyed from man to man by the general common law conveyances of feoffment, and the reſt; but muſt paſs by ſurrender to the lord or his ſteward, in the manner of common copyholds: yet with this difference, that, in the ſurrenders of theſe lands in ancient demeſne, it is not uſed to ſay "to hold at the will of the lord" in their copies; but only "to hold according to the cuſtom of the manor." Blackſtone's Com. book ii. &c.

VILLENEUVE, in *Geography*, a town of Switzerland, in the canton of Berne, ſituated at the eaſtern extremity of the lake of Geneva, about three miles from the mouth of the Rhône; celebrated for its trout fiſhery; 15 miles E.S.E. of Lauſanne. N. lat. 46° 25′. E. long. 6° 46′.—Alſo, a town of France, in the department of the Allier; 8 miles N.W. of Moulins.—Alſo, a town of France, in the department of the Tarn; 8 miles N.W. of Alby.—Alſo, a town of France, in the department of the Herault, on the Grand Canal; 3 miles S.E. of Beziers.—Alſo, a town of France, in the department of the Aveiron; 6 miles N. of Villefranche.—Alſo, a town of France, in the department of the Seine and Oiſe; 9 miles S.E. of Paris.

VILLENEUVE *d'Agen*, a town of France, and principal place of a diſtrict, in the department of the Lot and Garonne; 12 miles N. of Agen. N. lat. 44° 24′. E. long. 48′.

VILLENEUVE *l'Archévêque*, a town of France, in the department of the Yonne; 21 miles W.S.W. of Troyes.

VILLENEUVE *lez Avignon*, a town of France, in the department of the Gard, on the weſt ſide of the Rhône, oppoſite Avignon; 21 miles N.E. of Niſmes.

VILLENEUVE *de Berg*, a town of France, and ſeat of a tribunal, in the department of the Ardêche; 12 miles S. of Privas. N. lat. 44° 32′. E. long. 4° 35′.

VILLENEUVE *la Garenne*, a town of France, in the department of Paris; 3 miles N. of Paris.

VILLENEUVE *la Guyard*, a town of France, in the department of the Yonne; 15 miles N.N.W. of Sens.

VILLENEUVE *de Marſan*, a town of France, in the department of the Landes; 9 miles E. of Mont-de-Marſan.

VILLENEUVE *le Roy*, or *Villeneuve-ſur-Yonne*, a town of France, in the department of the Yonne, on the Yonne; 2 poſts N.W. of Joigny.

VILLENEUVE *St. George*, a town of France, in the department of the Yonne, on the Yonne, oppoſite Villeneuve-le-Roy.

VILLENOCE, a town of France, in the department of the Aube; 10 miles N.E. of Provins.

VILLENORE, a town of Hindooftan, in the Carnatic; 10 miles W. of Pondicherry.

VILLENOUVETTE, a town of France, in the department of the Herault, on the Orb, anciently confiderable, and furrounded with walls. It at one time contained three parifhes, now only one; 3 miles N.W. of Beziers.

VILLENTROIS, a town of France, in the department of the Indre; 18 miles N.E. of Châtillon-fur-Indre.

VILLEPEYS, or VILLEPAIS, a town of France, in the department of the Var, on the coaft of the bay of Frejus; 3 miles S.S.W. of Frejus.

VILLEPINTE, a town of France, in the department of the Aude; 6 miles S.E. of Caftelnaudary.

VILLEPREUX, a town of France, in the department of the Seine and Oife; 5 miles W. of Verfailles.

VILLEQUIER, a town of France, in the department of the Lower Seine, on the right bank of the Seine; 3 miles S.W. of Caudebec.

VILLEQUIERS, a town of France, in the department of the Cher; 18 miles E. of Bourges.

VILLEREAL, a town of France, in the department of the Lot and Garonne; 7 miles N. of Monflanquin.

VILLEREST, a town of France, in the department of the Rhône and Loire, on the Loire; 5 miles S. of Roanne.

VILLERS, a town of Brabant; 9 miles E. of Nivelle.

VILLERS *Bocage*, a town of France, in the department of the Somme; 7 miles N. of Amiens.

VILLERS *le Boccage*, a town of France, in the department of the Calvados; 12 miles S.W. of Caen.

VILLERS *fous Chalamont*, a town of France, in the department of the Doubs; 12 miles W. of Pontarlier.

VILLERS *Cotterets*, a town of France, in the department of the Aifne; 12 miles S.W. of Soiffons.

VILLERS *Farlay*, a town of France, in the department of the Jura; 6 miles N. of Arbois.

VILLERS *la Montagne*, a town of France, in the department of the Mofelle; 3 miles S.E. of Longwy.

VILLERS *fous Perny*, a town of France, in the department of the Meurte; 3 miles N.W. of Pont-à-Mouffon.

VILLERSEYSEL, or VILLERSACEY, a town of France, in the department of the Upper Saône; 9 miles S. of Lure.

VILLESHEIM, a town of the duchy of Wurzburg; 5 miles S.E. of Kitzingen.

VILLETERTRE, a town of France, in the department of the Oife; 6 miles S.E. of Chaumont.

VILLETTE *d'Anton*, a town of France, in the department of the Ifere, on the Rhône; 12 miles E. of Lyons.

VILLETTE *d'Iffins*, a town of France, in the department of the Ifere; 10 miles N.N.E. of Vienne.

VILLEVIEILLE, a town of France, in the department of the Higher Alps; 12 miles S.E. of Briançon.

VILLI, *Coarfe Hair*, in *Anatomy*, is fometimes ufed in the fame fenfe as fibres, or fibrillæ. See FIBRE.

VILLI, in *Botany*. See VILLOSUS.

VILLIE, in *Geography*, a town of France, in the department of the Rhône and Loire; 12 miles N. of Villefranche.

VILLIERS, GEORGE, in *Biography*, the firft duke of Buckingham, was defcended from an ancient family in Leicefterfhire, and born at Brookby in that county, A.D. 1592. His attention was directed by his mother, who undertook the charge of his education, to ornamental rather than folid accomplifhments, which were further improved by a refidence of three years in France, whither he was fent at the age of eighteen. His graceful perfon and gay difpofition recommended him at court, to which he was introduced by fir John Graham, a gentleman of the king's privy-chamber. In 1613, James I. conferred upon him the office of his cupbearer. Upon the fall of the earl of Somerfet, Villiers took his place in the affection and confidence of the king, who knighted him in 1615, and made him gentleman of the bedchamber, with a penfion of 1000*l.* a-year. He foon after became mafter of the horfe, and in 1616 was honoured with the garter, created a baron and vifcount, and in the following year advanced to the earldom of Buckingham, and admitted into the privy-council. After his return from Scotland, whither he accompanied the king in 1617, he was created a marquis, and promoted to the dignities of lord high-admiral of England, chief juftice in eyre fouth of the Trent, mafter of the king's-bench office, fteward of Weftminfter, and conftable of Windfor Caftle. He alfo employed his powerful intereft with the king for the advancement of his family and connections. His character was that of an ardent friend and implacable enemy, infolent and arrogant to thofe who oppofed him, and regardlefs of real merit in thofe whom he patronifed. To his pufillanimous fovereign and to prince Charles he manifefted his arrogant difpofition; but in order to engage the prince's attachment, he propofed a vifit of refpect to his intended bride, the infanta of Spain. The king, at firft averfe from this journey, at length granted to his importunity a reluctant confent. His manners, however, difgufted the Spanifh court, and he returned avowing his enmity to the prime minifter Olivarez. Such was his powerful influence at home, that he was appointed lord warden of the Cinque Ports. By mifreprefenting the negociations with Spain relating to the propofed marriage, he inflamed the nation againft the Spaniards, and became popular; and dreading the return of lord Briftol from his embaffy, and a true ftatement of this bufinefs, he joined the oppofers of the court and promoted popular meafures. Upon the acceffion of Charles his influence was augmented, and he was fent to France, in order to conduct into England the royal bride, Henrietta-Maria. During his vifit to France, he had the affurance to declare his affection for Anne of Auftria, queen of Lewis XIII., and to profecute his addreffes; and with this view, he determined to pay her a private vifit. The confequence would probably have been his affaffination; but forewarned of his danger, he declined the execution of his purpofe; fwearing, at the fame time, that he would fee and fpeak with that lady in fpite of the ftrength and power of France. To this circumftance lord Clarendon imputes his enmity againft the French court, and his attempt to alienate the affection of Charles from his queen. At length, his inordinate ufe of the power with which he had been entrufted rendered him an object of national jealoufy and abhorrence; and in May 1626, the earl of Briftol, who at his inftigation had been committed to the Tower, and afterwards banifhed from the court, exhibited againft him a charge of high-treafon. He was alfo accufed by the commons of high crimes and mifdemeanours; but his mafter averted the ftroke that was aimed againft him by the diffolution of parliament. In the war now fubfifting with Spain, he went to the Hague to concert a treaty with the States-general for the recovery of the Palatinate: but his conduct towards France foon produced a war with that country. At his folicitation, France was invaded in 1627 by an expedition under his command; and he landed on the ifle of Rhé, whence he was obliged to withdraw with great lofs. In order to recover his reputation after this difgrace, he advifed the calling of a new parliament; which, fo far from anfwering his purpofe, charged him with being the author of all

all the evils and dangers brought upon the king and kingdom, and drew up a remonſtrance, containing a ſtatement of the grievances of which he had been the cauſe. Theſe proceedings were ſtaid by a prorogation, and in the mean while he made an effort for recovering the good-will of the country, by fitting out an expedition for the relief of the Rochellers, then under cloſe ſiege, in whoſe fate the zealous Proteſtants felt great intereſt. Whilſt he was at Portſmouth, preparing for this expedition, Felton, who had ſerved under him as a lieutenant in the army, moved by diſcontent and a fanatical ſpirit, gave him a ſtab, which proved almoſt inſtantly mortal, and of which he expired Auguſt 23, 1628, having juſt completed his 36th year. His tragical death, unpopular as he was, occaſioned general commiſeration. His public character has been ſufficiently delineated in the preceding ſketch of his conduct. Poſſeſſing ſome qualities that excite vulgar applauſe, a high ſpirit, perſonal courage, ready elocution and generoſity, he had no other title to the appellation of a great man, which ſome have beſtowed upon him, beſides his advancement, by the erroneous judgment and partial favour of his ſovereign, to place and power. He married lady Catharine Manners, daughter and ſole heireſs of Francis, earl of Rutland, by whom he left two ſons and a daughter. In domeſtic life, he was an affectionate, though not a faithful huſband, and kind to his family. With him, it is ſaid, all-powerful favouritiſm at the Engliſh court terminated. Biog. Brit. Clarendon. Hume, &c. &c.

Villiers, George, ſecond duke of Buckingham, was the ſon of the preceding, and born A.D. 1627, at Wallingford-Houſe, Weſtminſter. He and his brother Francis received the rudiments of education under the ſame tutors with the king's own children, and were both entered at Trinity college, Cambridge, and afterwards ſent upon their foreign travels. Upon their return the civil war had commenced; and after having been preſented to the king at Oxford, they engaged in military ſervice under prince Rupert and lord Gerard. Upon this their eſtates were ſeized, but reſtored on account of their nonage. They afterwards renewed their travels in France and Italy. In 1648, when the king was priſoner in the Iſle of Wight, they returned to England, and joined the earl of Holland, who was in arms in Surrey; but in an engagement with the parliamentary troops at Nonſuch, lord Francis, who fought valiantly, was ſlain. The duke eſcaped to St. Neot's, and ſurrounded by the enemy, made way with ſword in hand through the guard, and joined prince Charles in the Downs. By adhering to the royal cauſe he forfeited his eſtates, which were then amongſt the moſt conſiderable belonging to any Engliſh ſubject. Whilſt he was abroad, his chief ſupport was derived from a ſale at Antwerp of his father's noble collection of pictures, which a faithful ſervant had ſecured. He attended the exiled Charles in Scotland, and accompanied him at the fatal battle of Worceſter, when his eſcape was no leſs extraordinary than that of his maſter. He afterwards ſerved as a volunteer in the French army, and occaſionally viſited the king's little court in Flanders. When the duke was informed that lord Fairfax had retired from the army and reſided on part of his eſtate, which parliament had allotted to him, that he had acted generouſly with regard to other forfeitures, and that he had an only daughter, he determined to venture into England and try his fortune. He ſoon gained the affection of the daughter, and they were married in 1657, at his lordſhip's ſeat of Nun-Appleton, near York; and Cowley is ſaid to have written an epithalamium on the occaſion. He was ſeized, however, in 1658, and committed to the Tower, very much to the diſpleaſure of his father-in-law. After the death of Cromwell, he was allowed to confine himſelf at Windſor Caſtle, and upon the abdication of Richard he obtained his liberty. The Reſtoration put him in poſſeſſion of all his eſtates, and he lived in ſplendour and magnificence, indulging in a profuſion of expence, which was very injurious to his fortune, and which was not counterbalanced by the poſts of a lord of the bed-chamber, lord-lieutenant of Yorkſhire, and maſter of the horſe, which the king aſſigned him. Reduced to deſperate circumſtances, or inclined to faction and intrigue, he was charged, as early as the year 1662, with treaſonable deſigns; ſo that in 1666 it became neceſſary for him to abſcond; and a proclamation was iſſued for apprehending him. However, he voluntarily ſurrendered himſelf, and contrived ſo to ingratiate himſelf with Charles, as to be reſtored to his place in the bed-chamber and in the council. Always an adverſary to lord chancellor Clarendon, he uſed his influence to accelerate his fall. In 1668 he joined ſir Orlando Bridgeman and ſir Matthew Hale in the laudable ſcheme of relaxing the ſeverities againſt the Non-conformiſts; but their plan for this purpoſe was defeated by the houſe of commons. Deſtitute of ſteady principle, the duke was ſelected, in 1670, to form one of the infamous party denominated the *Cabal*, (which ſee,) and he was deputed as ambaſſador to the court of France, in order to diſſolve the triple alliance, concerted by Temple and De Witt; and being a favourite with the French king, he concurred in all the meaſures of that court. He was ſuſpected, on account of his profligate character, with being acceſſory to the attempt made upon the life of the duke of Ormond, by Blood; and his cowardice was ſo contemptible, that he tamely bore from the duke's ſpirited ſon, lord Oſſory, the imputation of this villainy, accompanied with a menace, in the royal preſence. He was elected, however, in 1671, by court-intereſt, to the chancellorſhip of Cambridge; and in the ſame year was exhibited his comedy, called the "Rehearſal," which is ſaid to have been a joint production. The ſatire levelled againſt Dryden, then made poet-laureat, was thought to be juſt, but illiberal; and it was retorted by the poet in the character of the duke, under the name of Zimri, in "Abſalom and Achitophel."

In 1672, the duke was ſent to France to concert meaſures for the war which was intended to ruin the Dutch commonwealth. In 1674, the conduct of the Cabal being attacked in the houſe of commons, a motion was made for his impeachment, and he was queſtioned at the bar of the houſe. The reſult of this buſineſs was, that the commons voted an addreſs for his removal. But as he was directed and reſtrained in his conduct by no kind of principle, he joined the oppoſition to the court with the earl of Shafteſbury. In 1680, having ſold Wallingford-Houſe, he removed to the city, and there concurred in the politics of the oppoſition. Hume has delineated his character very juſtly, when he ſays of him, "the leaſt intereſt could make him abandon his honour; the ſmalleſt pleaſure could ſeduce him from his intereſt; the moſt frivolous caprice was ſufficient to counterbalance his pleaſure. By his want of ſecrecy and conſtancy, he deſtroyed his character in public life; by his contempt of order and economy, he diſſipated his private fortune; by riot and debauchery he ruined his health; and he remained at laſt as incapable of doing hurt, as he had ever been little deſirous of doing good to mankind." Such, notwithſtanding this appropriate character, was his inconſiſtency, that in 1685 he publiſhed a popular work, containing ſome juſt and liberal ſentiments, and entitled "A ſhort Diſcourſe upon the Reaſonableneſs of Men's having a Religion, or Worſhip of God." Upon his retirement, in declining health, to his manor of Helmſley, in Yorkſhire, and whilſt he was amuſing himſelf with rural ſports and company, he wrote a ſhort eſſay, entitled "A Demonſtration of the Deity." At length, in a fox-

fox-chace, he caught cold, which brought on a fever, that confined him in a tenant's houfe at Kirkby-moor-fide, where he was vifited by fome friends, and at their fuggeftion he received the facrament according to the rite of the church of England. On the third day of his illnefs he died, in April 1688, in the 61ft year of his age, and was interred in the family-vault at Weftminfter Abbey. He was an unfaithful hufband, and had no iffue by his wife. His amours were numerous; and of thefe, the principal was that with the countefs of Shrewfbury, who held his horfe while he killed her hufband in a duel. His writings, confifting of effays, poems, &c. have been collected in 2 vols. 8vo. and have paffed through four editions. He is faid to have devoted himfelf to chemical, or rather alchemical purfuits, in which he was the dupe of interefted and defigning perfons; and it is added, that he introduced the art of making cryftal-glafs from Venice. Biog. Brit. Hume.

Villiers de l'Isle Adam, Philip de, was a defcendant of an ancient French family, born in 1464, and elected grand-mafter of the order of St. John of Jerufalem in 1521. In the year after his election, the ifland of Rhodes, where he refided, was invaded by 200,000 Turks, againft whom he defended it with fuch vigour, that fultan Solyman came in perfon to fuperintend the attack; and after a fiege of fix months, in which the Turks are faid to have loft 100,000 men, he found it neceffary to furrender it. Solyman treated him with great refpect, declaring to one of his officers, that it was not without regret he obliged this Chriftian to leave his houfe at his age. Abandoning Rhodes in 1523 with fifty veffels, his remaining knights, and about 4000 of the inhabitants, he arrived at Rome during the papacy of Clement VII.; who affigned to him for a prefent refidence the town of Viterbo. In 1527 the emperor Charles V. offered the ifland of Malta, which in a general chapter it was determined to accept. He then went to Syracufe, and in 1530 received the donation by letters-patent of Malta, Gozo, and Tripoli in Barbary. In this year he fortified Malta; and from that period, the knights of St. John affumed the title of knights of Malta. After a life diftinguifhed by piety, courage, and prudence, he died in 1534, at the age of 70. Upon his tomb was infcribed this appropriate eulogy, "Here repofes Virtue victorious over Fortune." Moreri.

Villiers, in *Geography*, a town of France, in the department of the Côte d'Or; 6 miles N.N.W. of Châtillon-fur-Seine.—Alfo, a town of France, in the department of the Loire and Cher; 4 miles W. of Vendôme.—Alfo, a town of France, in the department of the Mayne; 6 miles N. of Château Gontier.

Villiers *en Vexeure*, a town of France, in the department of the Eure; 15 miles E.S.E. of Evreux.

Villiers *St. Benoit*, a town of France, in the department of the Yonne; 15 miles W. of Auxerre.

VILLIMPENTA, a town of Italy, in the department of the Mincio; 10 miles E. of Mantua.

VILLINGEN, a town of the duchy of Baden, in the Brifgau. This place, by means of the mountains and narrow acceffes leading to it, is extremely well fecured, and alfo fomewhat fortified by art. It has always ferved the Auftrians as a magazine for thefe parts, as well for provifions as military ftores. In it is an abbey of Benedictines; and its neighbourhood contains a good bath; 52 miles S.S.W. of Stuttgart. N. lat. 48° 4'. E. long. 8° 26'.

VILLOA, a town of the duchy of Piacenza; 10 miles S. of Piacenza.

VILLOISON, John-Baptist Gaspard d'Anse de, in *Biography*, was the defcendant of a family originally Spanifh, and born in 1750 at Corbeille-fur-Seine, and after receiving the rudiments of literature at feveral colleges, attended the Greek lectures of M. le Beau at Paris, and enjoyed the higher inftruction in this department of M. Capperonier, Greek profeffor in the royal college of France. Such were his talents and application, that with thefe advantages he became acquainted, at the age of fifteen, with almoft all the writers of antiquity in every clafs. In his refearches among MSS. in the library of St. Germain-des-Pres, he found a Greek lexicon of Homer by Apollonius, which he publifhed in 1773, with prolegomena and notes, that difplayed a very furprifing extent of erudition, confidering his early age, and that introduced him, out of the ufual form, into the Academy of Infcriptions and Belles Lettres. His next confiderable undertaking was an edition of the Paftoral of Longus, which was publifhed in 1778. In 1781 he obtained a miffion, at the king's expence, to examine the library of St. Mark in Venice, where he found feveral inedited works of rhetoricians, philofophers, and grammarians, a collection of which he publifhed in 2 vols. 4to. under the title of "Anecdota Græca." He alfo found a very valuable MS. of Homer's Iliad, with fcholia by ancient grammarians, which he committed to the prefs in 1788, accompanied with learned prolegomena. About this time he received an invitation from the duke and duchefs of Saxe-Weimar, to vifit their court, the moft literary in Germany; and here he collected various readings and emendations of the text of feveral Greek authors, which he printed at Zurich, under the title of "Epiftolæ Vimarienfes." Another of his publications is that of a tranflation of part of the Old Teftament, by a Jew of the ninth century, which he had found in the library of St. Mark; and of this he gave an edition, with notes, at Strafburgh in 1781. Soon after his return to Paris, and his marriage of an interefting young woman, he formed the purpofe of fearching for MSS. in the Eaft, and in 1785 he vifited Conftantinople, and afterwards Smyrna, and feveral iflands in the Archipelago, and Greece; and the refult of his refearches and obfervations was read before the Academy of Belles Lettres, on his return to Paris in 1787. At the commencement of the Revolution he retired to Orleans, for the purfuance of his literary plans; and the fruits of his confultations of ancient and modern authors were 15 large volumes in 4to. He alfo contemplated a larger work, which was a new edition of father Montfaucon's "Palæographia Græca." When the revolutionary tempeft fubfided, he returned to Paris, with literary treafure, in amaffing which he had expended three-fourths of his moderate fortune; and he was therefore under a neceffity of commencing a courfe of lectures in the Greek language, which proved unfuccefsful. He therefore gladly accepted the profefforfhip of modern Greek, which the government eftablifhed, and difcharged its duties till it was fuppreffed by Napoleon. From refpect to his merit, a profefforfhip of ancient and modern Greek was created for him alone in the college of France; but he was carried off by a lingering malady in April 1805, at the age of 55 years. In verbal knowledge Villoifon was deemed a profound fcholar; but to the higher qualities of intellect he is faid to have had no juft pretenfions. Gen. Biog.

VILLONA, in *Geography*, a town of Spain, in the province of Leon; 13 miles E. of Salamanca.

VILLOSLADA, a town of Spain, in Old Caftile; 20 miles S.E. of Najera.

VILLOSUS, in *Botany* and *Vegetable Phyfiology*, expreffes that kind of hairinefs which is longifh, foft, and fhaggy, like wool, yet does not amount to the thick entangled coat of many plants, which is properly termed woolly,

woolly, as in VERBASCUM; see that article: see also PUBESCENCE and LEAF.

VILLOUS, VILLOSA, is particularly applied to one of the coats or membranes of the stomach, called *crusta villosa*.

It takes its name from innumerable villi, or fine fibrillæ, with which its inner surface is covered.

VILLURBANNE, in *Geography*, a town of France, in the department of the Isere; 4 miles E. of Lyons.

VILMANSTRAND, or WILMANSTRAND, a town of Russia, in the government of Viborg, on the south coast of the lake Saima; 40 miles N.N.W. of Viborg. N. lat. 61° 20′. E. long. 27° 26′.

VILMAR, a town of Germany, in the circle of the Lower Rhine; 24 miles N. of Mentz.

VILMINOREU, a town of Italy, in the department of the Adda and Oglio; 28 miles N.E. of Bergamo.

VILMNITZ, a town of the island of Rugen; 7 miles S.E. of Bergen.

VILOVATOSTANOVITSCHE, a fortress of Russia, in the government of Archangel, near the Frozen ocean; 180 miles E.S.E. of Kola. N. lat. 68° 50′. E. long. 40° 14′.

VILS, a river of Bavaria, which passes by Amberg, &c. and runs into the Nab, at Kalmunz.—Also, a river of Wurtemberg, which rises near Wiesensteig, passes by Geislingen, Coppingen, &c. and runs into the Neckar, 2 miles N. of Wendlingen.

VILS, or *Gros*, a river of Germany, which runs into the Danube at Vilshofen.

VILS *Biburg*, a town of Bavaria; 8 miles S.E. of Landshut.

VILSECK, a town of Bavaria, on the Vils; 20 miles S.S.E. of Bayreuth. N. lat. 49° 36′. E. long. 11° 48′.

VILSEN, a town of Germany, in the county of Hoya; 5 miles W. of Hoya.

VILSHOFEN, a town of Bavaria, at the conflux of the Vils with the Danube; 11 miles W. of Passau. N. lat. 48° 29′. E. long. 13° 11′.

VILTRUM, a word used sometimes alone to express a filtre, instead of the word *filtrum*. But *viltrum* is more commonly joined with the word *philosophorum*, and then expresses the common alembic for distillation.

VILUI, in *Geography*, a river of Russia, which runs into the Lena, at Ust Viluiskoi. N. lat. 64°. E. long. 126° 14′.

VILUISKOI, NIZNEI, a town of Russia, in the government of Irkutsk, on the Vilui. N. lat. 63° 45′. E. long. 122° 44′.

VILUISKOI, *Ust*, a town of Russia, in the government of Irkutsk, at the conflux of the Vilui and Lena; 128 miles N.W. of Yakutsk. N. lat. 63° 50′. E. long. 126° 14′.

VILUISKOI, *Verchnei*, a town of Russia, in the government of Irkutsk; 200 miles N. of Oleminsk. N. lat. 63° 44′. E. long. 120° 24′.

VILVORDE, or VILLEFORTE, a town of France, in the department of the Dyle, situated on the river Senne; 6 miles S. of Malines.

VIM, a river of Russia, which rises in the government of Archangel, and runs into the Vitchegda, near Lialskoi, in the province of Ustiug.

VIMERCATO, a town of Italy, in the department of the Olona; 13 miles N.N.E. of Milan.

VIMIEIRO, a town of Portugal, in the province of Alentejo; 10 miles W. of Estremoz.

VIMINACIUM, or VIMINATIUM, in *Ancient Geography*, a town of Hispania Citerior, belonging to the Vaccæi; marked in the Itin. Anton. between Palentia and Lacobriga.

VIMINALIS, in *Mythology*, an epithet of Jupiter.

VIMINARIA, in *Botany*, was so named by the writer of this article, from *vimen*, a slender rod, or twig, in allusion to the habit of the plant.—Sm. in Sims and Kon. Annals of Botany, v. 1. 507. Brown in Ait. Hort. Kew. v. 3. 13.—Class and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, simple, of one leaf, bell-shaped, angular, with five short equal teeth, permanent. *Cor.* papilionaceous. Standard inversely heart-shaped, ascending, with a short claw. Wings oblong, obtuse, converging, shorter than the standard, each with a tooth at the base, on the lower side, and a short slender claw. Keel nearly equal to the wings, of two combined petals, with distinct claws, concave, with a blunt tooth at each side of the upper edge, at the base. *Stam.* Filaments ten, awl-shaped, distinct, rather ascending, the lower ones gradually longest, the upper one shortest; anthers roundish, two-lobed. *Pist.* Germen superior, oval, smooth; style capillary, ascending, as long as the stamens; stigma simple. *Peric.* Legume oval, half invested by the calyx, acute, slightly compressed, smooth, coriaceous, of one cell, not bursting. *Seed* solitary, oval-kidneyshaped, without any appendage.

Eff. Ch. Calyx angular, simple, five-toothed. Corolla papilionaceous. Style capillary. Stigma simple, acute. Legume leathery, of one valve, not bursting, entirely filled with a single seed.

1. V. *denudata*. Leafless Rush-Broom. Sm. in Ann. of Bot. as above. Exot. Bot. v. 1. 51. t. 27. Tr. of Linn. Soc. v. 9. 261. Ait. n. 1. (Daviesia denudata; Venten. Choix de Plantes, t. 6. Sophora juncea; Schrad. Sert. Hannov. 9. t. 3. Pultenæa juncea; Willd. Sp. Pl. v. 2. 506. Donn Cant. ed. 5. 101.)—The only known species, a native of New Holland and Van Diemen's island, said to have been introduced at Kew by sir Joseph Banks, in 1789. It is a rather hardy greenhouse shrub, flowering in July. The *stem* is branched, round and smooth. *Leaves* only to be seen on the lower part of seedlings, or young plants, alternate, on long smooth stalks, ovate, entire, three-ribbed, smooth, either acute or emarginate; at first sometimes ternate. The *footstalks* on the greater part of the plant are leafless, cylindrical, smooth, with two or three minute scales at the point; the lower ones six inches, or more, in length; the upper gradually shorter. *Clusters* terminal, solitary, simple, of many pretty yellow *flowers*, the disk of whose *standards* is red. Each partial *stalk* has a small *bractea* at the base.

VIMINATIUM LEGIO, in *Ancient Geography*, a town of Higher Mœsia, on the banks of the Danube, marked in the Itin. Anton. on the route from Mount d'Or to Constantinople, between Municipium and Ideuminacum.

VIMIOSO, in *Geography*, a town of Portugal, in the province of Tra los Montes; 15 miles W.N.W. of Miranda de Duero. N. lat. 41° 29′. E. long. 6° 14′.

VIMMALA, in *Natural History*, a name given by the people of the East Indies to a kind of pyrites, of a brassy appearance, and of a cubic figure.

They also give it in the same place to the pyritæ in general, when small, and of a simple internal structure.

VIMOUTIER, in *Geography*, a town of France, in the department of the Orne, on the Vic; 15 miles N.E. of Argentan.

VIMY, a town of France, in the department of the Straits of Calais; 5 miles N. of Arras.

VINA, or VENA, in *Hindoo Mythology*, is the father of Prithu, who is fabled to have been an incarnation of the god Viſhnu. Vina is the correct mode of writing the name of a muſical inſtrument of the Eaſt, commonly called *Been*; under which word we have given a deſcription, and referred to one of our plates for a repreſentation of it.

VINAGO, in *Ornithology*, a name given by ſome authors to the wood-pigeon, from the colour of its breaſt, ſhoulders, and wings, reſembling that of red wine. Its more uſual name among authors is *oenos*.

VINALHAVEN, in *Geography*, a town of America, in the diſtrict of Maine and county of Hancock, containing 1052 inhabitants; 60 miles E.N.E. of Brunſwick.

VINALIA, in *Antiquity*, a name common to two feaſts among the ancient Romans; the one in honour of Jupiter, and the other of Venus.

The firſt was held on the 19th of Auguſt; and the ſecond on the 1ſt of May. The Vinalia of the 19th of Auguſt were called *Vinalia ruſtica*; and were inſtituted on occaſion of the war of the Latins againſt Mezentius; in the courſe of which war, that people vowed a libation to Jupiter of all the wine in the ſucceeding vintage.

On the ſame day likewiſe fell the dedication of a temple of Venus; whence ſome authors have fallen into a miſtake, that theſe Vinalia were ſacred to Venus. But Varro L.L.L.V. and Feſtus, in *verbo Ruſtica*, diſtinguiſh between the two ceremonies; and expreſsly aſſert the Vinalia to be a feaſt of Jupiter.

VINARA, in *Geography*, a town of South America, in the province of Tucuman; 56 miles N.N.W. of St. Yago del Eſtero.

VINAROZ, a town of Spain, in the province of Valencia, on the coaſt of the Mediterranean; 5 miles N. of Peniſcola.

VINATA, in *Hindoo Mythology*, is the parent of the eagle of the Indian Jove, called Garuda, or Superna. He is alſo parent of the Aurora of Eaſtern fable, who is called Aruna, the driver of the car of Phœbus, or Surya. Under SURYA we have ſpoken of Vinata as the *paternal* anceſtor of Superna and Aruna, but it is rather an equivocal parentage, as Kaſyapa is ſometimes ſaid to be their father, and Diti their mother. (See KASYAPA.) The name of Vinata, or Vinava, ſeldom occurs in Hindoo books; though that of Vinateya, as a name of Superna, marking his parentage, is not very uncommon.

VINATEYA, a name of the Hindoo mythological eagle, more commonly called *Superna*; which ſee, and VINATA.

VINAY, in *Geography*, a town of France, in the department of the Iſere; 4 miles S. of St. Marcelin.

VINAZA, in *Ancient Geography*, a town of Africa Propria, upon the route from Tacapæ to Grand Leptis, between Aurus and Thalatum. Anton. Itin.

VINCA, in *Botany*, originally *Pervinca*, whence its Engliſh and French names, Periwinkle and Pervenche, is not ſatisfactorily explained by any etymologiſt. The beſt derivation of the word may perhaps be from *vincio*, to bind or wrap up, becauſe its long trailing or twining branches wind themſelves round, and entangle, every other plant in their way.—Linn. Gen. 115. Schreb. 163. Willd. Sp. Pl. v. 1. 1232. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 269. Prodr. Fl. Græc. Sibth. v. 1. 164. Ait. Hort. Kew. v. 2. 66. Juſſ. 144. Lamarck Illuſtr. t. 172. Gærtn. t. 117. (Pervinca; Tourn. t. 45.)—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Contortæ*, Linn. *Apocineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, erect, acute ſegments, permanent. *Cor.* of one petal, ſalver-ſhaped. Tube longer than the calyx; cylindrical in the lower part; dilated and grooved with five lines in the upper; five-angled at the mouth. Limb horizontal, in five deep equal ſegments, attached to the top of the tube, dilated outwards, obliquely lopped at the extremity, and ſlightly twiſted. *Stam.* Filaments five, inſerted into the tube, very ſhort, inflexed and then bent backward; anthers membranous, obtuſe, erect, incurved, bearing pollen at each margin. *Piſt.* Germens two, roundiſh, at whoſe ſides are two roundiſh bodies; ſtyle common to both germens, ſimple, cylindrical, the length of the ſtamens; ſtigma of two parts, the lower orbicular, flat, the upper capitate, concave. *Peric.* Follicles two, long, cylindrical, pointed, erect, each of one valve burſting lengthwiſe. *Seeds* numerous, oblong, cylindrical, furrowed, without down or wing.

Eſſ. Ch. Corolla of one petal, contorted, ſalver-ſhaped, inferior. Follicles two, erect. Seeds naked.

1. V. *minor*. Leſſer Periwinkle. Linn. Sp. Pl. 304. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 917. Curt. Lond. faſc. 3. t. 16. (V. pervinca minor; Ger. Em. 894. Clematis; Camer. Epit. 694, 695. Matth. Valgr. v. 2. 305.)—Stems procumbent. Leaves elliptic-lanceolate, ſmooth at the edges. Flowers ſtalked. Calyx-teeth lanceolate.—Found in buſhy places, groves, and about hedges, in Germany, England, France, Switzerland, and various parts of Greece. There can be little doubt of this being the κληματὶς of Dioſcorides, as all authors have thought. He ſpeaks of it as a native of Egypt. Dr. Sibthorp met with it in Arcadia, as well as in the countries of Elis and Argolis. In England this pretty plant is ſeldom found wild, though in gardens and ſhrubberies nothing is more commonly planted, particularly the double-flowered purple, and the white-flowered variegated kinds. They are all perennial, flowering in May. The *root* creeps extenſively. The *ſtems*, erect while in flower, become trailing, creeping very far, and are round, ſmooth, leafy. *Leaves* evergreen, oppoſite, ſtalked, entire, ſmooth, ſhining, about an inch long. *Flowers* axillary, ſolitary, alternate, ſtalked, erect, ſcentleſs, deep blue, white in the centre. We have never ſeen the *fruit* of this ſpecies.

2. V. *major*. Greater Periwinkle. Linn. Sp. Pl. 304. Willd. n. 2. Fl. Brit. n. 2. Engl. Bot. t. 514. Curt. Lond. faſc. 4. t. 19. (Pervinca vulgaris; Garidel Aix; t. 81. Clematis daphnoides major; Ger. Em. 894.)—Stems nearly erect. Leaves ovate, fringed. Flowers ſtalked. Calyx-teeth briſtle-ſhaped, elongated.—Native of thickets and groves, in rather moiſt ſituations, in England, France, Spain, Switzerland, and Carniola, flowering in May, being leſs rare with us than the former, and no leſs commonly cultivated for ornament in extenſive ſhrubberies, that will admit of its rambling mode of growth. There this ſpecies compoſes light, convex, evergreen tufts under trees and hedges. The *leaves* are thrice the ſize of *V. minor*, of a lighter green, and more ovate, or ſomewhat heart-ſhaped. *Flowers* larger, and rather more blue, with leſs of a violet tint. *Seed-veſſels* an inch and a half long, recurved, pointed, with ſeldom more than two roughiſh *ſeeds*, one above the other.

3. V. *lutea*. Yellow Periwinkle. Linn. Sp. Pl. 304. Am. Acad. v. 4. 309, not 307. Willd. n. 3. ("Apocynum ſcandens, ſalicis folio, flore amplo plano; Cateſb. Carol. v. 2. 53. t. 53.")—"Stem twining. Leaves oblong."—Native of Carolina. This has the habit of an *Echites*. We are quite unacquainted with the plant, nor did Linnæus ever ſee a ſpecimen.

4. V.

4. V. *rosea.* Madagascar Periwinkle. Linn. Sp. Pl. 305. Willd. n. 4. Ait. n. 3. Curt. Mag. t. 248. (Vinca; Mill. Ic. 124. t. 186.)—Stem shrubby, erect. Flowers sessile, in pairs. Leaves elliptic-oblong.—Native of the East Indies. Cultivated here by Mr. Thomas Knowlton, before the year 1756. It is now become a very popular stove-plant, flowering most part of the year, and recommending itself to general admiration, by the beautiful colour of its ample *blossoms*, whose *corolla* is either of a bright rose-colour, or pure white, the centre always of a peculiarly rich crimson, with a yellow eye. The *stem* is bushy, quite erect, about a yard high. *Leaves* entire, rather downy, two inches long, bluntish. This species is propagated easily, either by seed or by cuttings, but will not endure much cold or wet, though it requires a free air in summer.

5. V. *parviflora.* Small-flowered Periwinkle. Retz. Obs. fasc. 2. 14. Ait. n. 4. Willd. n. 5. (V. pusilla; Murray in Comm. Goett. for 1772. 66. t. 2. f. 1. Linn. Suppl. 166.)—Stem erect, herbaceous. Leaves lanceolate, acute.—Native of the East Indies. An Annual stove-plant, flowering in August, whose seeds were imported by sir Joseph Banks in 1778. The *stem* is about a span high, slightly branched. *Leaves* as long as the last, being about two inches, but much narrower, and acute. *Flowers* solitary or in pairs, small, with not much pretension to beauty; their *corolla* white, with a yellow eye, not ill compared by Willdenow to *Lithospermum officinale.*

Vinca, in *Gardening*, comprehends plants of the shrubby, evergreen, upright and trailing kinds, among which the species cultivated are, the small periwinkle (V. minor); the great periwinkle (V. major); and the Madagascar periwinkle (V. rosea).

The first has a perennial creeping root, and it varies in the colour of the flowers; with pale blue, with purple, and white, and with double flowers of these different colours; and the foliage is sometimes variegated either with white or yellow stripes.

The second sort is larger in all its parts than the preceding, having flowers of a purple-blueish colour. It varies with white flowers.

The third has an upright branching stem, three or four feet high, having a long succession of pale flesh-coloured flowers.

It varies with flowers with purple eyes.

Method of Culture.—These plants are all capable of being increased by layers, cuttings, and suckers.

In the first method, when the layers of the trailing branches are put down into the ground, they readily take root at almost any season. This is very much the case with the first sort, as almost every joint furnishes plants in the course of the summer ready to be put out in the autumn.

The cuttings may be made from the stalks and branches, and be planted in shady borders in the autumn or early spring, when they will become well rooted by the following autumn.

All the sorts succeed in this way.

In the third sort, the cuttings should be made from the young shoots and be planted in pots, plunging them in a hot-bed, or the bark-bed, where they will become perfectly well rooted in the same year, and may be potted off separately, being placed in the stove, and shifted as may be necessary into large pots.

This sort may likewise be raised from seed, which should be sown in pots in the early spring filled with light rich earth, covering them well in, and plunging the pots in the hot-bed, or the bark-bed of the stove; and when the plants have a few inches growth, they should be pricked out into separate pots, re-plunging them in a hot-bed, giving proper shade and water, managing them afterwards as the cuttings.

The suckers may be taken off with root-fibres in the autumn or spring, and planted where they are to grow.

The two first sorts afford variety in the borders, clumps, &c. and they may be planted in thickets and wildernesses under trees with perfect success; while the last has a fine effect in stove collections as an elegant evergreen and flowering shrub.

VINCAC, in *Geography*, a town of France, in the department of the East Pyrenées; 4 miles E.N.E. of Prades.

VINCELLES, a town of France, in the department of the Jura; 6 miles S.S.W. of Lons le Saunier.

VINCENNES, a town of France, in the department of Paris, in which was a royal palace, originally begun by Philip de Valois, but repaired and finished by Louis XIV.: the ancient towers served as a state prison. At this place the duke d'Enghien suffered death; 1 post E. of Paris.

Vincennes, a town of America, the capital of the territory of Indiana and county of Knox, on the bank of the Wabash, 150 miles from its mouth; in a delightful situation, surrounded by a prairie four miles long and one broad, mostly cultivated, and the remainder being a fine meadow which produces good grass. The soil, which is not inferior to any in the United States, yields corn, rice, wheat, tobacco, hemp, hops, grapes, &c. The Wabash is navigable, almost through the whole year, as far as this place. Commerce centres here, as the merchants bring their goods from Canada down the Wabash, from Orleans up the Mississippi, and from the eastern states, down the Ohio and up the Wabash. The fort, erected in 1787, stands on the E. side of Wabash river. It is garrisoned by a major and two companies. The inhabitants, principally of French extraction, amount to 670. It is a post-town; 743 miles from Washington.—Also, a township in the same territory and county, containing 223 inhabitants.

VINCENT, William, D.D. in *Biography*, dean of Westminster and vicar of Islip, Oxon, was a descendant of a race of ancestors who officiated as clergymen of the established church, and belonged to that class of ecclesiastics usually denominated the "High Church Party." They were seated at Shepey, in the county of Leicester. The dean was the last surviving son of Mr. Giles Vincent, who acquired a fortune as a packer under Spanish and Portugal merchants; but afterwards, by losses and disappointments in his commercial connections, retired from trade without being enriched by it. He was born in London, November 2, 1739, and being designed for the church, was entered at Westminster school in September, 1748, and in 1753 was admitted on the foundation. In 1757 he was elected to Trinity college, Cambridge, and supported there by his elder brother, who continued the business of a packer. He took his first degree of B.A. in 1761, and in the following year was appointed teacher at Westminster school. In 1764 he was graduated M.A.; in 1771 he became second master; in 1776, D.D. and one of his majesty's chaplains; in 1788, head-master of the school; and in 1798, president of Sion college. Having married in early life, his family rapidly increased, and some of his children were arrived at maturity before he obtained any considerable preferments in the church, notwithstanding the favourable situation which he occupied. In 1777 he was nominated by Dr. Markham, upon his elevation to the see of York, subalmoner to the king, an office which he held until his demise; and

and in 1778 he was advanced to the rectory of Allhallows, which in 1803 he resigned in favour of his eldest son. In 1801 he obtained a prebendal stall in the collegiate church of St. Peter, Westminster, which preferment enabled him to resign the laborious office of head-master of the school; and in 1802 he became dean. In 1807 he took possession of the rectory of Islip. On the parsonage-house, rebuilt by Dr. South, he expended between two and three thousand pounds, 1000*l.* of which arose from dilapidations, and the remainder furnished by himself, so as to render it a convenient and comfortable residence. It is mentioned as a remarkable circumstance in the life of this learned divine, that he passed twice, with great applause, through Westminster school; first, from the lowest form to the highest as a scholar, and secondly as an usher: nor is it less singular, that he almost constantly resided within the precincts of the Abbey, from his eighth to his seventy-sixth year, or during the interval of sixty-eight years, allowing for his temporary absence at Cambridge during his education, and on occasion of taking a degree. Notwithstanding his assiduous application to the duties of a sedentary profession, his life was prolonged to an advanced age; and after a fortnight's illness, he died at his favourite residence of the deanery, December 21st, 1815, in the 77th year of his age; leaving behind him two sons, both of whom are married and have children.

Whilst he was unremitting in his attention to his office as tutor, and to his various clerical duties, he devoted a portion of his time to compositions which have issued from the press. Of these, the first we shall mention was "A Letter to Dr. Richard Watson (afterwards Bishop of Llandaff), King's Professor in the University of Cambridge," 8vo. 1780, in reply to some observations introduced by this learned prelate into a sermon preached before the university of Cambridge, which was afterwards printed under the title of "The Principles of the Revolution vindicated," and into another discourse "On the Anniversary of His Majesty's Accession." In 1787 he published his tract on "Parochial Music;" in 1789, a sermon delivered before the sons of the clergy; and in 1792, a sermon preached at St. Margaret's, Westminster, for the Grey-coat school of that parish. In the latter discourse he noticed opinions, which were then prevalent, respecting the doctrines of natural liberty and equality; and more than 20,000 copies of it were printed and dispersed in and near the metropolis, and a great number was circulated through different parts of the kingdom. The next publication of Dr. Vincent was "The Origination of the Greek Verb, an Hypothesis," 8vo.; the title of which was altered in the second edition to "The Greek Verb analysed." This work was criticised with some humour, and not without a degree of asperity, in a piece entitled "Hermes unmasked." Our author's next publication was an elaborate dissertation on military affairs, entitled "De Legione Manliana Quæstio, ex Livio desumpta, et Rei Militaris Romanæ studiosis proposita," 1795. Six years afterwards appeared his principal performance, evincing his acquaintance with both ancient and modern geography and navigation, under the title of "The Voyage of Nearchus to the Euphrates; collected from the original Journal preserved by Arrian, and illustrated by Authorities ancient and modern, containing an Account of the first Navigation attempted by the Europeans in the Indian Ocean," 4to. 1799; and this was soon after followed by "The Periplus of the Erythrean Sea; containing an Account of the Navigation of the Ancients from the Red Sea to the Coast of Zanquebar, with Dissertations, Part I." 4to. 1800. Our learned author was next engaged in a controversy with Dr. Rennell, prebendary of Winchester and master of the Temple, occasioned by some reflections on the neglect of religion in our public institutions, which were introduced in a sermon preached in 1799, before the Society for promoting Christian Knowledge, at the annual meeting of all the charity-schools of the metropolis, in the cathedral of St. Paul's. To this sermon was annexed a note, in which the preacher declares his opinion, "that there is scarcely any internal danger which we fear, but what is to be ascribed to a *Pagan education*, under Christian establishments, in a Christian country." Dr. Vincent, then master of the only great public school in the metropolis, seemed at first to think that this attack was personal; but in order to avoid public contention, he commenced a private correspondence with Dr. Rennell, in the course of which ample and satisfactory explanations were made. But at the next anniversary, in 1800, Dr. O'Beirne, bishop of Meath, delivered a sermon, which was printed at the request of the Society, accompanied by a note, containing the same obnoxious assertions, together with additional remarks of his own. Dr. Vincent applied to the Society for permission to inclose in the parcels, containing its annual communications, a justification of the public instructors of England; but the Society declining to take a part in the controversy by complying with this request, the author committed to the press his "Defence of Public Education," addressed to the bishop of Meath, in which he makes an apology for the present system, and expresses himself in a high and indignant tone, in respect to the distinguished individuals whose supposed indiscretion had incurred his censure. As no reply was made, the contest terminated; and in order to prevent the recurrence of a similar event, the Society resolved, that the notes as well as the text of the annual sermon should for the future be submitted to its revision and approbation.

In 1802, our author published his thanksgiving sermon, preached at St. Margaret's, Westminster, before the honourable house of commons; in 1805, the second part of "The Periplus of the Erythrean Sea;" in 1809, "The Voyage of Nearchus, and the Periplus of the Erythrean Sea," translated from the Greek; and in Mr. Valpy's classical Journal, No. 18. "Observations on the Geography of Susiana." The dean also reviewed several articles in the British Critic, particularly that relating to the controversy about the Troad, and occasionally contributed articles to the Gentleman's Magazine. By such literary lucubrations Dr. V. amused himself in the intervals of his more laborious employments, passing a long and honourable life by devoting his mornings to reading and his evenings to the society of his friends; and towards the close of life, dividing his time between his deanery and his living of Islip. "In the bosom of his family," says one of his biographers, "Dr. Vincent was seen to the greatest advantage." In the tranquil and peaceful circle above briefly delineated, "he endeared himself to all around him, by the benignity of his disposition, the affability of his demeanour, and the charms of his conversation. Here were laid open that singleness of heart and simplicity of mind, which none could appreciate justly, but those who saw and were conversant with him in the free and familiar hours of domestic privacy. With qualifications which would have conferred dignity on the highest station in the church, and with an ambition, perhaps, not wholly averse from rank and elevation, Dr. V. nevertheless loved quiet and retirement." We shall close this article with some extracts from a biographer who has duly appreciated his talents and character. "As a clergyman," says this writer, "Dr. Vincent was regular and exemplary in the discharge of his duties; strictly orthodox in point of faith; and a firm supporter of all the doctrines,

doctrines, tenets, and practices of the church of England. His person, as well as enunciation, were well fitted for pulpit oratory: his voice, in particular, was sonorous; his animation produced a lively interest in the hearts of his auditors, while a certain dignity of manner commanded their implicit attention."—"As a writer, he possessed all the necessary requisites to gain the approbation of intelligent critics; he was indefatigably industrious; addicted to research; and learned in no common degree. While his literary labours evinced his intimate acquaintance with the ancients, his sermons were admirably adapted to the abilities and understandings of an ordinary audience. In both capacities his language was chaste; his composition elegant: in short, he continually reflected the images of a mind, richly imbued with learning, both human and divine."

"As a controversial writer, he sometimes bordered on asperity, and this, too, in respect of minor points; while with certain persons, from whom he differed in essentials, he exhibited no common share of moderation and liberality. Accordingly he did full justice to the talents of a Tooke, a Porson, and a Gibbon."

"As a school-master, he must be allowed to have had a number of distinguished pupils," among whom we may reckon the late and present dukes of Bedford, sir Francis Burdett, and his successor, as head-master, Dr. Carey; and in this capacity he is said to have been the acute, able, indefatigable, and strenuous assertor of the ancient discipline. Annual Biography and Obituary, for 1817, vol. i. Gent. Mag.

Vincent, Thomas, a celebrated performer on the hautbois, was a scholar of the admirable San Martini; and, after his master had ceased to perform in public, and had furnished him with concertos, was an unrivalled favourite on his instrument, till the arrival of Fischer.

In 1765 he became joint impresario of the Opera with Gordon.

Vincent, after the decease of San Martini, had been in great favour with his royal highness Frederic, prince of Wales, father to his present majesty; had acquired a considerable sum of money in his profession, which he augmented by marriage. However, the ambition of being at the head of so froward a family as an opera vocal and instrumental band, turned his head and his purse inside out; in short, he soon became a bankrupt, and his colleagues, though they escaped utter ruin, were not enriched by the connection. He ended his days in the evening of life, of which the morning had been so brilliant, in poverty and obscurity, and paid dear for his ambition and imprudence.

Vincent, Richard, who performed the first hautbois at Vauxhall Gardens from the beginning of musical performances there, and at Covent-Garden theatre more than thirty years. He was the father of the young musician who married the celebrated Miss Birchell, possessed with one of the finest treble voices that was ever heard in public. After performing at Vauxhall with great and constant applause, on the death of her husband she went to the East Indies, where she was still more applauded than in England, and where she was married a second time to John Mills, esq., a gentleman of fortune and consideration, with whom she returned to her native country, and lived happily in a splendid manner. She was buried in St. Pancras church-yard, where there is an honourable and affectionate epitaph inscribed on a tablet dedicated to her memory, by her surviving husband.

Vincent *of Beauvais*, a Dominican monk of the 13th century, was appointed by St. Lewis, king of France, inspector of the education of his children. About the year 1244, he compiled a kind of encyclopædia, entitled "Speculum Majus," which consisted of four parts, *viz.* "Speculum Naturale, Doctrinale, Morale, et Historiale." Notwithstanding all its errors, it passed through many editions; the first at Strasburg in 1476, and the last at Douay in 1624. He was also the writer of a "Letter to St. Lewis on the Death of his eldest Son," and of a "Treatise on the Education of Princes;" and died in 1624. Brucker by Enfield.

Vincent Ferrier, or Ferrer, a Dominican, was born at Valencia, in Spain, in 1357; and having entered into the order of preachers in 1374, obtained the degree of doctor in theology at Lerida in 1384. He was the chosen companion of cardinal de Luna, the pope's legate to France; and on his return was summoned to Avignon, in 1394, by the same cardinal, when he rose to the papal chair under the name of Benedict XIII. Yielding to an imagined impulse for preaching the word of God, he became a missionary in 1397, and travelled through several countries, not excepting Britain and Ireland. He also exerted himself in terminating the discord of the Romish church with regard to the papacy, and finding Benedict unrelenting, he abandoned him, and assisted at the council of Constance. In 1407 he accepted the invitation of John, duke of Brittany, and fixed the seat of his mission at Vannes, where he died in 1410. After his death, miracles were said to have been wrought at his tomb, and he was canonized by pope Calixtus III. He was the author of many devotional tracts; and his "Treatise on the spiritual Life, or interior Man," was frequently reprinted. Dupin. Moreri.

Vincent *of Lerins*, was a native of Gaul in the fifth century, who abandoning the military profession, and adopting a religious life, retired to the monastery of Lerins in Provence, where he became a priest. He was held in high estimation for his piety and learning; and after his death, in the reign of Theodosius and Valentinian, was canonized by the Roman church, to which he was thought to be entitled for his "Commonitorium adversus Hæreticos," which was neatly written, and much applauded by the Roman Catholics. Of this work Dr. Maclaine, deviating from the article of Mosheim, says, that he can see nothing in it but a blind veneration for ancient opinions. It has been printed in the "Bibliotheca Patrum," and has been published separately, particularly at Cambridge, in 1687. Dupin. Mosheim.

Vincent de, Paul, founder of the congregation of the "Priests of the Missions," (see Mission,) was born at Poui, or Poy, in the diocese of Acqs, in the year 1576, and advanced, on account of his extraordinary talents, and by a course of education at Acqs and Toulouse, from the humble condition of a shepherd to the office of priest in 1600. Having occasion soon afterwards to visit Marseilles, for the purpose of receiving a small property which devolved upon him by inheritance, he was, upon his return by sea to Narbonne, taken captive by a Barbary corsair, and sold for a slave at Tunis. Here he served several masters, the last of whom, who was a Savoyard renegado, he was successful in reclaiming. They both determined on making their escape, and arrived safely in a small boat at Aigues Mortes, in 1607. Upon his return to his native country, he was deputed by Peter Montorio, vice-legate of Avignon, on business of importance to the court of Rome; and here he was intrusted by the minister of Henry IV. with a commission to that monarch in 1608. In return for this service, Lewis XIII. conferred upon him the abbey of St. Leonard de Chaueme. Having been introduced as tutor to the family of M. de Goudy, general of the galleys, he conceived the design of founding

founding the congregation above-mentioned; and in the mean while, wishing to serve the miserable objects that were under the care of his patron, he applied to court for the appointment of almoner-general of the galleys, and obtained it in the year 1619. His assiduity in the discharge of the duties of his office, as well as the piety and benevolence of his disposition, engaged the general esteem and respect of the inhabitants of Marseilles. Devoted to acts of compassion and beneficence, he was entrusted, in the year 1620, with the direction and government of the order of the "Daughters of Charity." His next object was the accomplishment of his purpose with regard to a new community, in which he obtained the concurrence of some priests, who made choice of him as their principal. This institution was prosperous, and the number of the society having increased, he accepted the great house of St. Lazarus, in the suburb of St. Denis, which became the principal house of his order; and in 1632, its utility was acknowledged by pope Urban VIII., who formed it into a regular congregation, and appointed its founder as the first superior general. The rule prescribed to the society enjoined, independently of attention to their own religious exercises, the appropriation of eight months in the year to the instruction of the common people in the neighbouring parishes, to the relief of the sick and indigent, to inspection of seminaries in which young persons were educated for holy orders, and to other acts of private and public service. The superior conducted himself with so much zeal and activity, that he obtained encouragement in the prosecution of his plan, not only in all parts of France, but also in Italy, Scotland, Barbary, Madagascar, &c. Not satisfied with the single object to which his benevolent attention was first directed, he took a very active part in the conduct and support of many other institutions of a benevolent and useful kind. So highly was he esteemed on account of his piety and prudence, and his zeal for doing good, that he was engaged in regular attendance on Lewis XIII. during his last sickness; and under the regency of Anne of Austria, mother of Lewis XIV., he was the chief adviser in all the ecclesiastical affairs of the kingdom. For a period of ten years, during which he possessed this influence, he maintained the most exemplary character in the discharge of his public duties, as well as in his private conduct. He died in 1660, at the age of nearly 85 years. He was beatified by pope Benedict XIII. in 1729, and canonized by Clement XII. in 1737; and it must be allowed, that he occupies a distinguished rank among the saints in the Romish calendar. Moreri. Mosheim.

VINCENT, GREGORY *St.* See GREGORY ST. VINCENT.

VINCENT, in *Geography*, a township of America, in the state of Pennsylvania, and county of Chester, containing 1630 inhabitants; 25 miles W. of Philadelphia.

VINCENT, *St.*, one of the Cape Verd islands, being one of the four situated towards the north-west, about 30 miles in circumference; the land of which is generally elevated, but towards the north-west low and sandy; so that it is unproductive, and the island probably still uninhabited. It has good fresh water, which springs up on digging a little way into the soil of the valley, but the hills are totally destitute of it; and, therefore, the island is improper for cattle. It has a fine large road called Porto Grande, with a rock like a tower in the centre. The bay, which is about a league and a half broad at the mouth, is surrounded with high mountains, and stretching into the middle of the island, is thus sheltered from the west and north-west winds; and, therefore, it is deemed the safest harbour in all the Cape Verd islands; but difficult of access, on account of the impetuous winds that blow off the mountains along the coast, so as to endanger ships before they can arrive at this place of security. Besides this bay, there are several others on the south side, in which ships may anchor; and these are generally chosen by the Portuguese for landing their hides. The fish are numerous and excellent. The south part of the island is situated in N. lat. 16° 50′. W. long. 25°. See *Cape* VERD.

VINCENT, *St.*, one of the Charibbee islands in the West Indies, about 40 miles in length, and 10 in breadth. Dr. Campbell says, that the Spaniards called it by this name, because they discovered it upon the 22d of January, which, in their calendar, is St. Vincent's day; but it does not appear that they ever, properly speaking, had possession of it; as the Indians were very numerous here, on account of its being the rendezvous of their expeditions to the continent. At length, however, ambition and avarice effected an establishment for a class of intruders, who were long distinguished by the name of the black Charaibes, whom the native Charaibes regarded at first with contempt and pity. Of the origin of these intruders Campbell gives the following account. In 1672, king Charles II. divided the governments in the West Indies, and, by a new commission, appointed lord Willoughby governor of Barbadoes, St. Lucia, St. Vincent, and Dominica; and sir William Stapleton governor of the other Leeward islands, which separation has ever since subsisted. On the demise of lord Willoughby, he was succeeded by sir Jonathan Atkins, who continued governor until the year 1680, when the government was transferred to sir Richard Dutton; who, being sent for to England in 1685, appointed colonel Edwin Stade lieutenant-governor; and he, with a view of asserting and maintaining the British rights, by constituting deputy-governors for the other islands, exerted himself in preventing the French from wooding and watering in this island without permission. At this time it was intimated to him, that the king had signed an act of neutrality, and that commissioners were appointed by the two courts to settle all differences relating to these islands. Some years after, a ship from Guinea, with a large cargo of slaves, was either wrecked or run ashore upon the island of St. Vincent, into the woods and mountains of which great numbers of the negroes escaped, whom the Indians suffered to remain. Partly by the accession of runaway slaves from Barbadoes, and partly by the children they had by the Indian women, these Africans became very numerous; so that about the beginning of the 18th century, they constrained the Indians to retire into the north-west part of the island. These people, as may be reasonably supposed, were much dissatisfied with this treatment; and complained of it occasionally both to the English and to the French, that came to wood and water amongst them. The latter at length suffered themselves to be prevailed upon to attack these invaders. After much deliberation, in the year 1719, they came with considerable force from Martinico, and landing without much opposition, began to burn the negro huts, and destroy their plantations, supposing that the Indians would have attacked them in the mountains; which, if they had done, the blacks had probably been extirpated, or forced to submit, and become slaves. But either from fear or policy, the Indians did nothing, and the negroes sallying in the night, and retreating to inaccessible places by day, destroyed so many of the French, that they were forced to retire. When by this experiment they were convinced that force would not do, they had recourse to fair means; and by dint of persuasion and presents, patched up a peace with the negroes as well as the Indians, from which they received great advantage.

tage. Things were in this situation, when captain Uring came with a considerable armament, to take possession of St. Lucia and this island, in virtue of a grant of king George I. to the duke of Montague. When the French had dislodged this gentleman, by a superior force, from St. Lucia, he sent captain Braithwaite, in the year 1723, to try what could be done at the island of St. Vincent, in which he was not at all more successful. After this, the country became a theatre of savage hostilities between the negroes and the Charaibes, in which it is believed that the former were generally victorious: it is certain they proved so in the end, their numbers, in 1763, being computed at 2000; whereas of the red or native Charaibes, there were not left more than 100 families, who retained only a mountainous district, and most of these are by this time said to be exterminated. It is, however, worthy of remark, that the African intruders have adopted most of the Charibbean manners and customs: among the rest, the practice of flattening the foreheads of their infants; and it was perhaps from this that they acquired the appellation of black Charaibes. St. Vincent being ceded to the English by the peace of Paris, in the year 1763, as well as Dominica and Tobago, St. Lucia being assigned to France, (the Charaibes not being mentioned in the whole transaction,) the first measure of the English government was to dispose of the lands, without any regard to the claims of the Charaibes of either race; which, in truth, were considered as of no consequence or validity. This gave rise to a war with the Charaibes, in the course of which it became the avowed intention of government to exterminate those miserable people altogether; or by conveying them to a barren island on the coast of Africa, consign them over to a lingering destruction. By repeated protests and representations from the military officers employed in this disgraceful business, and the dread of parliamentary inquiry, administration at length thought proper to desist; and the Charaibes, after surrendering part of their lands, were permitted to enjoy the remainder unmolested. On the 19th of June 1779, St. Vincent shared the common fate of most of the British West Indian possessions, in that unfortunate war with America, which swallowed up all the resources of the nation, being captured by a small body of troops from Martinico, consisting only of 450 men, commanded by a lieutenant in the French navy. The terms of capitulation, however, were favourable, and the island was restored to the dominion of Great Britain by the general pacification of 1783. It contained at that time 61 sugar estates, 500 acres in coffee, 200 acres in cacao, 400 in cotton, 50 in indigo, and 500 in tobacco, besides land appropriated to the raising of provisions, such as plantains, yams, maize, &c. All the rest of the country, excepting the few spots that had been cleared from time to time by the Charaibes, retained its native woods. St. Vincent contains about 84,000 acres, which are every where well watered; but the country is very generally mountainous and rugged: the intermediate valleys, however, are fertile in a high degree, the soil consisting chiefly of a fine mould, composed of sand and clay, well adapted for sugar. The extent of country at present possessed by the British subjects is 23,605 acres; and about as much more is supposed to be held by the Charaibes. All the remainder is thought incapable of cultivation or improvement. The island, or rather the British territory within it, is divided into five parishes, of which only one had a church, and this was blown down in the hurricane of 1780. There is one town called Kingston, the capital of the island, and the seat of its government; and three villages that bear the name of towns, but they are inconsiderable hamlets, consisting each of a few houses only. The botanic garden of St. Vincent consists of 30 acres, of which no less than 16 are in high cultivation. In the frame of its government, and the administration of executive justice, St. Vincent seems not to differ from Grenada. The council consists of twelve members, the assembly of seventeen. The salary of the governor is 2000*l.* sterling, half of which is raised within the island, the other half being paid out of the exchequer of Great Britain. The military force, according to Mr. Edwards, consisted in his time of a regiment of infantry, and a company of artillery, sent from England, and a black corps raised in the country. The militia includes two regiments of foot, serving without pay. The number of inhabitants, says Mr. Edwards, amounts to 1450 whites, and 11,853 negroes. The several smaller islands dependent on the St. Vincent government are Bequia, containing 3700 acres, a small island, valuable for the commodiousness of its bay, called Admiralty bay; Union, containing 2150 acres; Canouane, containing 1777 acres; and Mustiqua, containing about 1200 acres. The negroes employed in the cultivation of these islands, being about 1400, are supposed to be included in the 11,853 before mentioned. There are likewise the little islets of Petit Martinique, Petit St. Vincent, Maillereau, and Bellesеau, each of which produces a little cotton. N. lat. 13° 10′. W. long. 61°. Edwards's West India Islands, vol. i.

VINCENT, *St.*, a town of United America, in the western territory of the Wabash. N. lat. 38° 44′. W. long. 88° 6′.

VINCENT, *St.*, a town of France, in the department of the Lot; 6 miles W. of Cahors.

VINCENT, *St.*, a sea-port town of Brasil, in the government of St. Paul, situated on the sea-coast; 150 miles W. of Rio Janeiro. See SANTOS, ST. *Vicente*, and VICENTE.

VINCENT, *St.*, a river of Madagascar, which runs into the Indian sea, on the east coast, S. lat. 21° 48′. E. long. 44°.

VINCENT, *St.*, a town of Peru, in the diocese of La Plata; 40 miles N.E. of Lipes.

VINCENT *d'Ardentes*, *St.*, a town of France, in the department of the Indre; 7 miles S.E. of Châteauroux.

VINCENT, *Cape St.*, the south-west point of Portugal, where commences a chain of lime-stone mountains, which terminates at Tavira, N. lat. 37° 2′. W. long. 9° 5′. Towards this cape the hills become flatter, and this promontory itself is a desert plain, consisting of a grey lime-stone, so naked and rough near the front, that it is very difficult to travel over it. In other parts it is nearly covered with sand. Toward the sea the rock is every where fractured, about 50 to 80 feet high, being of equal height with Cabo de Rocca, which it somewhat resembles. At the utmost extremity in this desert country is a monastery of Capuchins. Ships can approach very near the rock, so that in fine weather the monks can speak to the persons on board. The famous naval engagement between the Spaniards and lord St. Vincent was distinctly seen from this monastery. On another point of the rock, separated by a creek from the extreme end, is the small fort of Sagres, within which nothing is seen but the commandant's dwelling, the soldiers' barracks, and the works which are not allowed to be surveyed. Without the fort are only two houses. At the time when the earthquake of 1755 destroyed Lisbon, the sea swelled here, and pouring from the creek over the land, laid the country waste. At Sagres a great quantity of fish and muscles is taken, and small fishing-smacks lie at anchor under the rock in the creek. Five small leagues from Cape St. Vincent is the city of Lagos, which is properly the chief town of Algarve, though it be no longer the residence of the governor of that province.—Also, a cape on the west coast,

coast of Madagascar. S. lat. 25° 38′. E. long. 43° 50′.—Also, a cape on the east coast of Terra del Fuego. S. lat. 54° 25′.

VINCENT *de Connozal, St.*, a town of France, in the department of the Dordogne; 14 miles W. of Perigueux.

VINCENT *de Beira, St.*, a town of Portugal, in the province of Beira; 15 miles W.N.W. of Castel Branco.

VINCENT *de la Barquera, St.*, a sea-port of Spain, in the province of Asturia; 9 miles W.S.W. of Santillana.

VINCENT *de Rivedot, St.*, a town of France, in the department of the Dordogne; 6 miles S. of Riberac.

VINCENT'*s Bay, St.*, a bay on the north coast of Terra del Fuego, a little to the east of Cape St. Vincent. Before the anchorage ground, says captain Cook, lie several rocky ledges that are covered with sea-weed; but not less than eight and nine fathoms over all of them. It appears strange that where weeds, which grow at the bottom, appear above the surface, there should be this depth of water; but the weeds which grow upon rocky ground in these countries, and which always distinguish it from sand and ooze, are of an enormous size. The leaves are four feet long, and some of the stalks, though not thicker than a man's thumb, above 120. Mr. (sir Joseph) Banks and Dr. Solander examined some of them, over which we sounded and had 14 fathoms, which is 84 feet; and as they made a very acute angle with the bottom, they were thought to be at least one half longer. The footstalks were swelled into an air-vessel, and these eminent naturalists called this plant *fucus giganteus*. They went on shore, and in about four hours returned with above a hundred different plants and flowers, all of them wholly unknown to the botanists of Europe. They found the country about the bay to be in general flat, the bottom of it in particular was a plain, covered with grass, which might easily have been made into a large quantity of hay; they found also abundance of good wood and water, and fowl in great plenty. Among other things, of which nature has been liberal in this place, is Winter's bark, *Winteranea aromatica;* which may easily be known by its broad leaf, shaped like the laurel, of a light green colour without, and inclining to blue within; the bark is easily stripped with a bone or a stick.

VINCENT *de la Pazes, St.*, or *Onda*, a town of Popayan, in Terra Firma, about 25 miles E. of St. Sebastian's, with a port, where canoes from Carthagena and St. Martha unload their merchandize.

VINCENT, *Port St.*, lies on the coast of Chili, in the South Pacific ocean, 6 miles N.N.E. of the mouth of the river Bobio, with a safe harbour, secure against all winds but that from the west, which blows right into it. Talcaguana port is six miles to the north of it.

VINCENT'*s Rocks, St.*, rocks on each side of the river Avon, about three miles below Bristol; at the bottom of which is the spring from which rise what are called the Bristol waters.

VINCENT *Island*, a small island in the North Pacific ocean, at the entrance into Portlock's harbour. N. lat. 57° 48′. W. long. 136° 30′.

VINCETOXICUM, in *Botany*, from *vinco*, to conquer, and *toxicum*, poison, a name which first occurs in Dodonæus, *Pempt.* 407, and which he says had been recently given to the officinal *Asclepias*, (A. Vincetoxicum, Linn. Sp. Pl. 314. Cynanchum Vincetoxicum of Brown, in Ait. Hort. Kew. v. 2. 77.)—The plant thus denominated was supposed destitute of the dangerous and acrid properties of the rest of its tribe, because its juice is not milky. The root, whose flavour and scent resemble Valerian, has been used as a counter-poison, in the place of Contrayerva, whose name has the same meaning, and each may have its use as a tonic, or stimulant, however erroneous the idea may seem of a specific, against any poison whatever, except by a chemical alteration of its qualities. Among plants, at least, no such marvellous power has hitherto been ascertained. The above root is scarcely ever used in this country.

VINCETOXICUM, in the *Materia Medica*. As a medicine, this root has been chiefly used in dropsical disorders, but its good effects are not sufficiently established; which is also the case with respect to Stahl's pulvis antihydropicus, in which the vincetoxicum is an ingredient. It has been also recommended in malignant fevers, and even in the plague, by some German authors; and hence called "Contrayerva Germanorum." It is said likewise to be useful in small-pox, scrophula, and uterine obstructions. The dose, in powder, is from a scruple to a drachm, or an infusion of three or four drachms. Woodville.

VINCI, LIONARDO DA, in *Biography*, the illegitimate son of Piero da Vinci, a notary of the signoria of Florence, distinguished himself during his life as a man of science and of literature, a philosopher, poet, painter, and musician of the most profound study, and the most exalted taste. He was born at the castle of Vinci, in the lower vale of the Arno, in 1452. From his earliest years he testified a more than ordinary share of ingenuity, and particularly exhibited an ardent desire for drawing. This at length became so decided a preference above all other pursuits, that it determined his father to indulge and cultivate it; and for this purpose he placed him under the tuition of Andrea Verocchio, a skilful designer, and eminent as a sculptor, an architect, and a painter. The progress of Lionardo equalled the sanguine expectation his intellectual abilities had excited; and whilst a youth, he surpassed his master in the practice of the art he had learnt of him. Verocchio had been employed by the monks of S. Salvi at Valombroso, to paint the Baptism of Christ, as an altar-piece for their church, and having made his designs, he entrusted the preparation of the parts to his disciples. Among them, the young Da Vinci was ordered to paint the figure of an angel, which he did with so much taste and skill, and so far surpassing the work of his master, that Verocchio, mortified at being excelled by a youth, abandoned the art, and from that time confined himself to sculpture.

The career of this extraordinary man, thus begun in honour, was pursued with enthusiasm in all things relative to art and science. Nature had endowed him with the beauties of body and of mind, and he cultivated the useful exercise of both. His person was finely proportioned, and his features beautiful and expressive; he was dexterous in feats of arms, the management of the horse, and all the favourite amusements of the time. He was admirably skilled in mechanics, was an able anatomist, and an architect; was learned in natural philosophy, optics, and geometry: in short, he had steadily applied himself to acquire a thorough knowledge of the operations of nature; and was besides an excellent poet and musician.

Thus endowed, and constituted to apply these endowments with energy to every useful and ornamental purpose, fame crowned his portion of human felicity by spreading the renown of his uncommon talents throughout Italy. His various application of them had however one evil attending it,—a certain portion of instability: the impetuosity of his nature, leading him too rapidly to new projects, often prevented the completion of those already commenced. In his youth, Vasari says, he invented mills and engines to go by water for various purposes, and contemplated schemes for making the Arno navigable from Pisa to Florence he; made plans

plans for roads, for raising water, &c.: yet amidst these occupations he cultivated drawing most assiduously from all kinds of objects of animated nature, in a style of the most laboured and exquisite finishing, as if he never could attain too close an imitation of the object he had selected. He always strove to make them appear as strongly relieved as possible; their defect is, that not having hit upon the true nature of relieving objects, such as has been exemplified in the Dutch school since his time, he laboured his works to blackness; and whilst his principal objects appeared illumined by the light of the day, his shadows partook of the blackness of night.

He delighted in observing those whose character was strongly marked, who had any thing extravagant in the style of their beards, their hair, or dress, and would follow them till he had fixed their form fully in his mind, and then go home and draw them. By studies of this nature he became possessed of strong ideas of expression and of character, and employed himself actively in the use of them in designs; though the finished works of his hand, which conjecture places at this period of his life, are not of a kind to exhibit much of their application.

His life, Lanzi observes, "may be divided into four periods, the first of which was, as we have seen, spent in prosecuting his studies in art, and occasionally applying them to practice in Florence: to this belong not only the head of Medusa, and the few works mentioned by Vasari, but probably all those paintings of his which have less energy of shade, less complicated drapery, and heads of forms rather delicate than exquisite, seemingly derived from the school of Verocchio. Such are the Maddalenas of the Pitti palace at Florence, and the Aldobrandini at Rome; some Madonnas or holy families in various galleries, as the Justiniani and Borghese; some heads of the Saviour and of the Baptist; though the multitude of his imitators must render all decision on their originality ambiguous. Of a different class, however, and without a doubt of his hand, is the Bambino, who lies in a little ornamented bed, richly dressed and adorned with necklaces, which is in the apartment of the Gonfalonière at Bologna."

After this first period of his life, when he was forty-two, *viz.* in 1494, he was invited to Milan by the duke Ludovico Sforza, to whom Lionardo rendered himself more particularly acceptable by playing upon the lyre, and upon one of a peculiar form, which he himself had made. To this instrument he sung also admirably, and recited verses extemporaneously, surpassing all who attempted that species of amusement. But the more effective cause assigned for his going to the duke, was a design entertained by that prince of erecting a monument of bronze to the memory of his father. Among the manuscripts still existing of Lionardo, is a memorial presented by him to the duke about 1490. In it he offers his services in various military mechanical contrivances, for the purpose of aiding in sieges, passing rivers, &c. and also for the conducting water-courses, sculpture in bronze or marble, and painting; and in conclusion remarks, "that at the same time that these things are going on, the equestrian statue to the memory of the duke's father need not be neglected." So that it appears by this, that the modelling and erection of this statue were the primary objects for which he was carried to Milan; and it was executed by him in bronze, and erected in the city, where it remained till it was demolished on the incursion of the French, after the defeat of Ludovico. The duke appointed him director of the academy of painting and sculpture, which he had recently revived with additional splendour; and under his instructions many pupils arose, who increased the love and renown of the arts, as he in great measure banished the remains of the Gothic style, and introduced his own new and more elevated one in its stead.

Here, by desire of the duke, he painted a Nativity, which was sent by him as a present to the emperor of Germany; but if we except this, the portraits of the duke and duchess, and his grandest work in the art, the Last Supper, painted on the walls of the refectory of the Dominican convent of the Madonna delle Grazie, he does not appear to have occupied much of the time he spent at Milan (which was about five years) in painting. Indeed he scarcely could devote more time to it, as the duke engaged him as an engineer to conduct the waters of the Adda to the walls of Milan: an immense operation, in which, after much study and labour, he had nearly succeeded, when it was interrupted by the French. He also made many models of ingenious mechanical contrivances, and among them a lion, in compliment to the king of France, on his arrival at Milan, which, after advancing by itself many paces to meet the monarch, suddenly stopped when it came near him, reared upon its hinder legs, and threw open its breast, which was filled with lilies.

Whilst these various inventions shewed the versatility of his powers, the picture above alluded to, the Last Supper, gave immortality to the fame of the moment. Of this picture, one only character is given by all who have written or spoken of it,—that of superior excellence in all the most admirable and exalted qualities of the art. Unfortunately, his knowledge in chemistry was not equal to his love of novelty, or he would not have painted it with a vehicle and a ground totally discordant, which necessarily led to a speedy destruction of the surface. He painted it with oil colours upon the plastered wall, and in consequence the colour cracked and peeled off; so that in fifty years after it was painted, when Armenini visited it, he says "it was already half spoiled;" and Scannelli, who saw it in 1642, says, that "the subject was scarcely discernible." Lanzi, in speaking of it recently, observes, that "what with the attempts to restore it by oils and varnishes, and with the repainting which has accompanied these attempts, there now remain only three heads of the apostles by the hand of Da Vinci, and those rather drawn than coloured." The assent, therefore, which may be now given to the high testimony of contemporary authorities as to the merit of this great work, rests with the copies which were made when the picture was perfect, (and they are many,) and the general character of Lionardo's talent.

There has lately been introduced into England, and is now exhibiting, (1817,) a copy as large in length as the original, said to be the one painted by M. Uggione, a pupil of Da Vinci, for the convent of the Carthusians at Pavia: which in 1793, upon the breaking up of that order, was sold with the other effects of the convent, and is now brought here. In it there remains sufficient of the grandeur of style adopted by its great author to satisfy every beholder of the justice fame has done to his talents. The selection of matter, the general treatment of the subject, the unequalled truth and variety of expression, the close attention paid to character and to nature; the depth, richness and brilliancy of its colour, with the high degree of finish to which it was carried,—all are manifested in this copy, though in some parts imperfectly. In it also are seen the want of many points in chiaro-scuro and in colour, which, if they could have been combined with the matter it contains, (and they have since then been combined by Titian and others,) would place the original of this picture in every respect at the head of all the pictures which ever were painted.

During his residence at Milan, Du Fresne says he composed his very useful work "Il Trattato della Pittura," for the use of the pupils in the academy under his care; and his studies for the equestrian statue doubtless gave rise to the curious and learned memoranda of the structure of that animal, as his former studies did to those concerning the human figure, which are found in the manuscript in the library of Buckingham-House. It appears to have been his customary practice to write his thoughts constantly, and accompany the passages by appropriate illustrations in drawing; and it would have been well for the art, if every eminent professor had adopted the same habit: we should then have been in possession of a mass of information which would much alleviate the necessities involved in practice, and enable men to express their thoughts and inventions without encountering the difficulties which not unfrequently stifle the most beautiful and sublime conceptions in their birth.

The activity and exertions of Lionardo, supported by such uncommon talents, had already formed many skilful artists, who afterwards became renowned, and who would probably have rendered Milan the rival of Florence as a school of art, but for the disastrous issue of a contest between the duke and the king of France, in which, in 1500, the former was defeated, captured, and carried into the country of his enemy, where about ten years afterwards he died.

By this event the progress of the arts at Milan was broken up, with its academy for a time, and its illustrious president returned to Florence, where the arts were encouraged by the house of Medici. In this third period of his life, his first work was a design for an altar-piece for the chapel of the college of the Annunciate, the subject of which was a group, of our Saviour with the Virgin and St. Anne, which was universally approved and admired; yet it does not appear that the picture was ever painted, at least to remain in Italy. It is said, that by the desire of Francis I. he made a picture from it, and certainly one is shewn in the royal collection at Paris, painted from the design, though in a heavy and low tone of colour.

He employed himself also about this time on a portrait of Mona Lisa, known by the name of La Gioconda, a Florentine lady, wife of Francisco del Gioconda, for whom it was painted. This picture he is said to have employed himself upon during four years, but we must conceive it to mean only that it remained unfinished that length of time. It is in possession of the king of France, and attests, by its exquisite finish, the laborious attention of its author. It has a very beautiful expression, particularly about the mouth; but is black and heavy in the shadows: in fact it is overlaboured, and had probably been far better had it left his study sooner.

In 1503, the council of Florence having determined to decorate their chamber with works of art, Lionardo was appointed to execute one side of it; and M. Angelo, then only twenty-nine years of age, but whose gigantic powers were already matured, was selected, as his competitor, to undertake the other. A most unfortunate coalition, as the emulation it excited, aided and strengthened to bitterness by the mistaken affection of admiring partisans of either master, produced in the end the most confirmed jealousy, and even hatred, between these two great men, and divided Florence into parties, who embittered their disputes, without being able to reconcile their differences. Lionardo chose for his subject the battle of Nicolo Picinino against Attila. He had prepared his cartoon, and proceeded in a certain degree with his picture in oil colours, when to his great mortification he found, that owing to some imperfection in the preparation of the ground, his colours began to peel from the wall, and he abandoned the work.

The cartoon, however, of which we have one group preserved to us in the Battle of the Standard, engraved by Edelinck, had exalted his name highly among artists and connoisseurs, who flocked to Florence to see it and its rival, which had been prepared by M. Angelo; and among others Raffaelle, in 1504, was drawn there, allured by the desire of improving the taste he had imbibed in the school of Perugino; and there, with the benefit he derived from these great works, and the instruction of Bartolomeo della Porta, he shook off in a great degree the dry and Gothic manner of his master, and laid the foundation of his future fame.

Lionardo appears to have divided his residence at Florence and at Milan till 1513, during which time he probably painted his own portrait, which is in the gallery at Florence, a head whose energy leaves all the rest in the room far behind, and that perhaps which in many cabinets is called the portrait of Raffaelle. The half figure also of a young nun in the palace Nicolini; Christ among the doctors, formerly in the Doria palace; the supposed portrait of queen Giovanna, adorned with beautiful architecture; that picture in the Barberini of Vanity and Modesty, the beauty and finish of which no one has ever been able to convey in a copy;—these appear, with many others, to belong to this period, when, free from other serious occupations, he was at liberty to attend to painting with increasing power.

No work, however, of any consequence like his Last Supper, was entrusted to him after the failure in the Hall at Florence, so that his great and deserved renown in the art is principally upheld by that work, and the remnant of the cartoon above-mentioned, to which his minor works, though beautifully wrought, are but trifles.

The election of cardinal Giovanni di Medici to the tiara under the title of Leo X. induced Lionardo to visit Rome, which he had never seen: and from his previous knowledge of the pontiff, he hoped for honour and employment. He went there with his patron Giuliano di Medici, and was graciously received by Leo, who soon after signified his intention of employing his pencil. Upon this Lionardo began to distil his oils and prepare his varnishes, which the pope seeing, and being unacquainted with the necessities of the painter's style, he exclaimed with surprise, that nothing could be expected of an artist who thought of finishing his works before he had begun them. This unlucky *bon mot* disconcerted the painter, and prevented him from proceeding: and probably he found the ground too firmly occupied by Raffaelle and M. Angelo, (who as the pope said produced works while Lionardo gave words,) to leave room for the expectation of honourable employment for himself. He therefore accepted an invitation from Francis I., king of France, to visit his court, and left Rome in 1514 for that purpose, having spent his time there principally in the production of various fantastic and diverting mechanical contrivances, but in nothing of importance.

This change of circumstances marks the fourth period into which Lanzi divides the life of this most extraordinary man, and with its commencement terminated his career in art, as he appears to have been so exhausted by anxiety and sickness on his arrival in France, that he was never more able to use the pencil. For the five years that he continued to exist, it was but to struggle under an incurable complaint, during the continuance of which the king frequently visited him; and it has been said, that in one of these visits Lionardo, exerting himself beyond his strength to shew his sense of his majesty's condescension, was seized with a fainting fit, and that the king stooping forwards to support

fupport him, he expired in his arms. This event occurred on the 2d of May, 1519, at a place called Cloux, near Amboife, and in the 67th year of his age.

There are fo many imitators of the ftyle of Da Vinci, that it is extremely difficult to know what to regard as his among the numerous minor productions which are prefented to us as the product of his eafel. Among thofe imitators, Bernardino Luini holds the firft rank, and his pictures are conftantly impofed upon us as thofe of Lionardo. Lorenzo di Credi is another who copied Lionardo with great exactnefs. Antonio Sogliani alfo imitated and copied him as well as others; fo that no wonder there are fo many works brought to fale under the high pretenfion of his name, by which our connoiffeurs are duped and our picture-dealers are enriched.

The real character of Lionardo da Vinci as a painter is of the higheft quality, as we have before obferved. He is the parent of the chiaro-fcuro, upon which the fame of Correggio principally depends; and he firft a tempted to combine high finifh with felection of parts and grandeur of ftyle, particularly aiming to give intelligence to character and expreffion to features; in fact, to pourtray the mind: and in this no one has ever furpaffed him, not even Raffaelle, who followed in this refpect the road opened by Da Vinci. What is commonly called the beau-ideal, was not exactly the form he appears to have fought; but he had fo much the feeling which generated it, that he always took from his model the effential and characteriftic, leaving out the mean and ufelefs. Hence we find in his picture of the Laft Supper fo great a variety of character and of expreffion, which thofe who have attached themfelves to the antique as their guide have never given; the imitation having, as we conceive, always fuperfeded the original fpirit of felection which dictated the tafte of the ancients.

Two different manners are obfervable in his painting; one with dark fhades, ftrongly contrafting with the lights, the other more placid, and conducted with more of middle teint. Grace of defign, expreffion of the mind, and fubtile management of the pencil, triumph in and adorn each; all is gay in his pictures, but efpecially the heads of his women and children. In thefe he conftantly repeated one idea, giving a fmile to them which it is impoffible to behold without experiencing a fympathetic impulfe. Yet, if one may judge from the labour of his pictures, he rarely reached the point at which he aimed, having an impreffion in his own mind more full and complete than he could render by his pencil; and, like Protogenes of old with his Jalyfus, knew not, as Apelles faid of him, when to leave off, nor could be contented with good, when he afpired after the beft.

As an author, Lionardo da Vinci has rendered effential fervice to art, particularly in his Treatife on Painting, which is the only one of his numerous compilations that has been given to the public, and which has been recently (in 1802) tranflated into Englifh by a member of our Royal Academy, J. F. Rigaud, efq. Venturi fpeaks of this work as having been compiled from various of his manufcripts, which were doubtlefs the product of his every-day reflections, fet down as they occurred, and without attention to order or arrangement. It treats of proportion, anatomy, motion and equipoife of figures, perfpective, compofition, expreffion, light and fhade, colouring, &c. in 365 precepts, fome of which are confufed and not eafily to be unravelled, others are common place, but moft are learned, ingenious, and ufeful. The reft of his mifcellaneous works, treating of the anatomy of the horfe and of the human fubject, of perfpective, optics, hydraulics, botany, &c. were left by him in his will to his friend and pupil Francifco Melzi, and confifted of fourteen volumes, large and fmall, which by various means found their way into the national library at Paris, and one is in poffeffion of our own fovereign. Venturi, who faw thefe at Paris, fays "that they contain fpeculations on thofe branches of natural philofophy neareft allied to geometry, are extremely mifcellaneous, and entered without regard to method or arrangement." Whether the change of events in the political world fince his time has reconveyed thefe remains to the Ambrofian library at Milan, we know not, but moft probably they are again returned there. The one in the library at Buckingham-Houfe was the property of Pompeo Leoni, who obtained it, with two others fince returned, from H. Melzi, and it is probable it was acquired by the earl of Arundel for Charles I. It was found, foon after his prefent majefty's acceffion, in the fame cabinet where queen Caroline found the portraits of the court of Henry VIII. by H. Holbein.

Vinci, Leonardo, an admirable opera compofer of the Neapolitan fchool, is faid to have run away from the confervatorio of Gli poveri in Giefu Crifto in that city, where he was the fcholar of Gaetano Greco, on account of a quarrel with Porpora, a ftudent of the fame feminary. He began to diftinguifh himfelf in the year 1724, when he fet the opera of Farnafe for the Aliberti theatre at Rome. So great was the fuccefs of this drama, that he was called upon to furnifh at leaft one opera every year till 1730, when he compofed two, "Artaferfe," and "Aleffandro nell' Indie," both written by Metaftafio. Thefe, as we were informed at Rome, he fet for half price, to gratify his enmity to Porpora, who was then his rival, in that city.

The vocal compofitions of Vinci form an era in dramatic mufic, as he was the firft among his countrymen who, fince the invention of recitative by Jacopo Peri, in 1600, feems to have occafioned any confiderable revolution in the mufical drama. The airs in the firft operas were few and fimple; but as finging improved, and orcheftras became more crowded, the voice-parts were more laboured, and the accompaniments more complicated. In procefs of time, however, poetry feems to have fuffered as much as ever from the pedantry of muficians, who forgetting that the true characteriftic of dramatic mufic is clearnefs; and that found being the vehicle of poetry and colouring of paffion, the inftant the bufinefs of the drama is forgotten, and the words are unintelligible, mufic is fo totally feparated from poetry, that it becomes merely inftrumental; and the voice-part may as well be performed by a flute or violin, in the orcheftra, as by one of the characters of the piece, on the ftage. Vinci feems to have been the firft opera compofer who faw this abfurdity, and, without degrading his art, rendered it the friend, though not the flave to poetry, by fimplifying and polifhing melody, and calling the attention of the audience chiefly to the voice-part, by difentangling it from fugue, complication, and laboured contrivance.

In 1726, he fet Metaftafio's "Didone Abandonata" for Rome, which eftablifhed his reputation; for in this exquifite drama, not only the airs were greatly applauded, but the recitative, particularly in the laft act, which being chiefly accompanied, had fuch an effect, that, according to count Algarotti, "Virgil himfelf would have been pleafed to hear a compofition fo animated and fo terrible, in which the heart and foul were at once affailed by all the powers of mufic." Saggio fopra l'Opera in Mufica.

We fhall mention the reft of this pleafing and intelligent compofer's operas, the airs of which long ferved as models to other mafters, and are not yet become either ungraceful or inelegant.

In 1727, he compofed "Gifmondo, Re di Polonia;" in 1728,

1728, "Catone in Utica;" in 1729, "Semiramide Riconosciuta;" and in 1730, "Alessandro nell' Indie," and "Artaserse," all for the theatres in Rome. The celebrated air at the end of the first act of Artaserse, "Vo solcando un mar crudele," originally composed for Carestini, is well known, and is perhaps the only production of Vinci by which his merits have been favourably estimated in England. In the printed book of the words, Vinci is called "Pro-vice maestro della Real Capella di Napoli."

We have been able to find no more of his works after this period; so that he must either have begun late, or been cut off early in life, as his great and durable renown seems to have been acquired in the short space of six years of his existence.

Vinci began that free and truly dramatic style of composition, which Hasse and Pergolesi afterwards, perhaps, improved; but it is a style which no good composer, except Gluck, has abandoned. It has been, indeed, embellished and rendered more elegant by the disciples of Durante: Piccini, Sacchini, Traetta, and Anfossi; but they have all been guided by the outline of Vinci.

This justly admired composer died at Rome in 1731, during the first run of his Artaserse. Metastasio, in a letter to the Romanina, makes a melancholy reflection on the subject: "Poor Vinci! Now that merit will be known, which during his life was blasted by his enemies.

"What a miserable being is man! He thinks fame the only good that can render him happy; but alas! he must die ere he is allowed to enjoy it; and if he does not die, envy will make him wretched for attempting to acquire it."

One of our own poets has made a similar reflection on the vanity of human wishes for any other than posthumous fame.

"For such the frailty is of human kind,
Men toil for fame, which no man lives to find;
Long rip'ning under ground the *china* lies:
Fame bears no fruit, till the vain planter dies."
Earl of Mulgrave.

VINCIA, Vence, in *Ancient Geography*, a town of Gallia Narbonnensis, N. of Antipolis, and the capital of the Narusci. The town seems to have been consecrated to the god Mars, and Cybele was worshipped there.

VINCULO *Matrimonii*, *Divorce à*. See Divorce.

VINCULUM, in *Algebra*, a character in form of a line, or stroke drawn over a factor, divisor, dividend, when compounded of several letters, or quantities; to connect them, and shew that they are to be multiplied, or divided, &c. together, by the other term.

Thus, $d \times \overline{a + b - c}$, shews that d is to be multiplied into $a + b - c$.

VINCUM, in *Ancient Geography*, a town of Lower Germany. Anton. Itin.

VINDALIUM, Védène, a village of Gallia Narbonnensis, upon the left of the Rhone, N.W. of Cypresseta.

VINDANA, a port of Gallia Lyonnensis. Ptol.

VINDELICIA, a country of Europe, N. of the Alps and S. of the Danube, near Rhætia. It has been conjectured that this name is formed of two words, which are the names of two rivers that water the country; one called *Vindo* (the Wertach, which passes to Augsburg), and the other *Lichus* (the Lech). Strabo and Ptolemy differ in their assignment of the bounds of this country. According to Strabo, the Vindelicians lived near the Salasses, and inhabited a part of the mountains which regarded the east and turned towards the S. He adds that they were the limitrophes of the Helvetians and Boians. According to this author, the Rhætians did not touch the lake of Constance, except in a part of their borders, that is, between the Rhine and Bregentz; but this town, which Ptolemy assigns to the Rhætians, really belonged to the Vindelicians. The Helvetians and Vindelicians occupied a great part of the banks of the lake. Upon the whole we may conclude, from the observations of Strabo, Pliny, Tacitus, and Sextus Rufus, who have all taken a part in settling the boundaries of Vindelicia, that in its ancient state it had the Danube to the N., and that the river Ænus separated it from Norica on the E. side, and that on the W. it extended from the lake of Constance to the Danube. Its boundaries on the S. are less satisfactorily ascertained. Strabo says that the Vindelicians possessed mountainous plains at the extremity of the Alps; and he represents this country as contained between the Licus and the Ænus. M. D'Anville, in his Ancient Geography, says that the country of the Vindelici extended from the town of Brigantia (Bregentz), on the lake of Constance, to the Danube; and that the lower part of the course of the Ænus or of the Inn separated it from Morbihan. A powerful colony was established in the angle formed by the two rivers Vindo and Licus, whence the nation seems to have derived the appellation of Vindelici; and Augusta, given to this colony, preserves its name in that of Augsbourg, between the two rivers Lech and Wertach, the first of which actually separates Suabia from Bavaria.

Vindelicia, when it was subjugated by the Romans, was joined to Rhætia, and the whole country, contained between the lake of Constance, the Danube, the Inn, and the country of the Carni, the Insubres and Venetians, was always called Rhætia, or Provincia Rhætia. Nevertheless, the Rhætians and Vindelicians formed two separate people, although they inhabited the same province. Accordingly Horace calls the inhabitants of Vindelicia, Rhæti Vindeli, to distinguish them from the inhabitants of Rhætia properly so called.

VINDELIS, or Vindilis, an island placed by the Itinerary of Antonine between the Gauls and Great Britain; but this is done in so vague and indefinite a manner, that it is not possible to say what island is meant. Some authors think that it is the isle of Portland.

VINDEMIATING, formed of *vindemia*, *vintage*, the gathering of grapes, or other ripe fruits; as apples, pears, cherries, &c.

VINDEMIATRIX, or Vindemiator, a fixed star of the third magnitude, in the northern wing of the constellation Virgo.

VINDENUTA, Vindunita, *Vindimita*, or *Vindonitensis insula*, in *Ancient Geography*, an island of France, in dependence on the town of Nantes. It was to this island Friard is supposed to have retired in 560, to pass the life of an indolent and useless hermit; and he thus acquired the name of St. Friard.

VINDERIUS, a river of Hibernia, having, according to Ptolemy, its mouth on the eastern coast, between the promontory Isamnium and the mouth of the river Logia. Camden thought that it is the present bay of Knockfergus.

VINDIA, or Vinda, a town of Asia, in Galatia, upon the route from Pessinunte to Ancyra, between Germa and Papira. Anton. Itin.

VINDICATION, Claiming, in the *Civil Law*, an action arising from the property a person has in any thing: or a permission to take or seize a thing, as one's own, out of the hands of a person, whom the law has doomed not to be the true proprietor.

VINDICATORY *Part of a Law*. See Law.

VIN-

VINDICTA, among the Romans, the prætor's rod or switch, with which he touched a slave's head when he was enfranchised.

VINDINATES, in *Ancient Geography*, a people of Italy, in Umbria.

VINDINUM, a town of Gallia Lyonnensis, belonging to the Aulerci or Cenomani. Ptol.—Also, a town of Italy, in Umbria.

VINDIUS or VINNIUS *Mons*, one of the most considerable mountains in Hispania Citerior, according to Ptolemy and Florus. The name is applicable to the chain of mountains which, detaching itself from the Pyrenees, traverses Biscay and the Asturias, and forms, at the entrance of Galicia, two branches, one extending itself to Cape Finisterre, and the other, turning to the S., traverses the country of the ancient Bracares.

VINDIUS *Mons*, a mountain of India, on this side of the Ganges. Ptol. It extends from the S.W. to the N.E., S. of the country called Sandrabatis.

VINDO, a river of Germany. See VINDELICIA.

VINDOBONA, *Vienna in Austria*, a town of Superior Pannonia, six miles from Cetium, according to the tables of Peutinger. It is marked in the Itinerary of Antonine upon the route from Sirmium to Treves, between Motanum and Comagenes.

VINDOGLADIA, VINDUGLADIA, or *Vindocladia*, a town of Great Britain, in the 12th Iter of Antonine, on the route from Calleva to Uriconium, between Sorbiodunum (Old Sarum) and Durnovaria (Dorchester); supposed to be near Cranburn. Dr. Stukeley traced the Roman road all the way from Old Sarum, for 13 miles, to near Borofton, where he places Vindocladia.

VINDOMAGUS, one of two towns mentioned by Ptolemy, as belonging to the Volcæ Arecomici: the other being Nemausus. Although the precise situation of Vindomagus is not certainly known, the presumption lies in favour of Vigan, because it affords many monuments of antiquity, and has been mentioned under the name of Vicanus for 600 or 700 years. It is in the same parallel with Nimes, and only about half a degree differing in longitude, and corresponds in a variety of respects to the place marked out by Ptolemy.

VINDOMIS, VINDOMUM, or *Vindonium*, a town of Great Britain, in the 12th Iter of Antonine, on the route from Calleva to Uriconium, between Calleva (Silchester) and Venta Belgarum (Winchester). If Mr. Horsley has rightly placed Calleva at Silchester, it is probable that he has fixed justly on the scite of Vindonis at Farnham.

VINDOMORA, a town of Great Britain, in the 1st Iter of Antonine, on the route from the limit, vallum or wall to Prætorium (Broughton), between Corstopitum (Cowbridge) and Vinovia (Binchester). The situation of this place, fixed at Ebchester, is evidently mistaken by Gale and Camden, the former fixing it at Dolande, within less than five miles of Cowbridge, and the other at Wall's-End, which is altogether out of the way of this Iter, that proceeds from N. to S. along the famous military road called Watling-street. See Horsley's Brit. Rom. p. 396.

VINDONISSA, the station of the 21st legion, according to Tacitus, the position of which unites many Roman ways. The distance marked xxii in the Theodosian table, with respect to Augusta Rauracorum, is more suitable than that of xxvii in the Itinerary of Antonine. Vindonissa is named Vindo in a panegyric of Constantine by Eumenes; and Castrum Vindonissense in the notitia of the provinces of Gaul lies in Maxima Sequanorum. This town had been an episcopal see; but having been ruined towards the end of the sixth century, or the commencement of the seventh, this bishopric became that of Constance, and Mayence was recognised as the metropolis, although Vindonissa, included in the Sequanois, should have acknowledged Besançon under this dignity. The place which it occupied upon the bank of the Russ, near its junction with the Aar, is denominated Windisch.

VINE, in *Botany* and *Gardening*. See VITIS.

It is said that vines were first planted about the rivers Rhine, Maine, and Moselle, and also in Hungary, and the northern part of Gaul, about the year 276. But with respect to the provinces of Gaul and Spain, which border on the Mediterranean sea, as well as to Italy, many are of opinion that vines grew spontaneously there. Julius Cæsar found vines growing in Gallia Narbonnensis, *i. e.* Languedoc and Provence; and Strabo remarks, that the said province produced all the kinds of fruit which Italy afforded. The Phœnicians are said in early times to have planted vines in the isles of the Mediterranean sea, as well as in several parts of the continent both of Europe and Africa. It appears that there were real vineyards in England in 1140 and 1230. And. Com. vol. i. p. 16, and p. 81.

VINE, *Black*. See TOURNEFORTIA *Volubilis*.

VINE, *Climbing five-leaved*, of *Canada*, a species of *Hedera*; which see.

VINE, *Spanish Arbor*, a species of *Ipomœa*; which see.

VINE, *Wild*, or *White Vine*. See CISSUS *Sicyoides*, and *Acida*.

VINE, *Culture of, in the Field or open Ground*, in *Rural Economy*, the growth and management of it in such situations for the use of the grapes in making wine. It would seem probable that the cultivation of this plant might be conducted with advantage in this intention, in many situations in the southern parts of this country; especially as some of them are well known to be nearly within the vinous latitude, which is found to extend between the twenty-fifth and fifty-first degree in the northern hemisphere: and, as in Germany, it is found by experience, that all such vineyards as are situated within the latter of these limits, are capable of being cultivated with considerable profit; though where they stretch much beyond it, their success is extremely doubtful. Proper cultivation and management are, therefore, all which appear necessary in raising crops of this sort.

In speaking of the means of establishing vineyards in this country, Mr. Speechly has remarked, in his useful work on the subject, that there are four things which ought to be materially considered; namely, the situation; the soil; the kinds of vines which are the most fit and proper to be planted; and the mode of their management.

In regard to the first, it is said that an elevated situation, where there is a gentle declivity to the south or south-east, is esteemed preferable to low grounds, which are generally subject to damps and spring-frosts, even at times when the adjoining high grounds are entirely free from both. Vineyards or grounds of this kind, too, should be well protected and sheltered to the north, as well as to the north-west and north-east. In a hilly country there are generally many favourable spots, where nature has given important advantages, and which should be still further improved by art for this purpose. Plantations of forest-trees, judiciously formed, would, it is supposed, contribute much to give warmth and shelter; but these should not be placed too near the vineyards, so as to confine the air, as that would prove very injurious to them.

In wine countries it is well known, that vineyards are often not only confined to gentle declivities, but that they are frequently formed on slopes, on the sides of hills

hills and rocks, which are sometimes so steep as even to border upon precipices; and that vineyards thus situated produce grapes uncommonly rich, yielding wines of the most excellent quality. Consequently, from the hills which border upon the English Channel having declivities which tend towards the south, they would appear, it is thought, to be highly proper for the growth of the vine. And that the excavations in them, from which chalky materials have been taken, where they have a southern exposure, would likewise seem well calculated to answer the same purpose.

In what respects the nature of the ground, it has been observed that the vine delights in such gravelly and rocky soils as are frequently found on the sides of steep hills and rocks, and that it has sometimes been known to flourish among mere stones and gravel. It grows most favourably in a light, dry, sandy, or gravelly soil, which is perfectly free from stagnant moisture: consequently it may be noticed, that the introduction of the vine into this country would have no bad effect in respect to agriculture, as all strong and deep lands, which are best adapted for tillage, are the most unsuitable for the cultivation of the vine.

But besides gentle declivities and light soils, vines, it is said, grow in situations and soils where the land could hardly be rendered profitable in any other way. And thus, though vines would not grow robust on the steeps of poor, gravelly, and rocky soils, still they would be more productive than when planted on rich lands, and the fruit be greatly preferable. All such hills as have the above aspect or exposure, and are composed of either slate, gravel, scaly rock, or lime-stone, are of course highly proper for being planted upon. It is therefore evident, that there is a considerable portion of soil in the southern districts of this kingdom that is well adapted for the growth of vines.

However, the success of a vineyard in this country would, it is thought, most essentially depend on the kinds of vines which are propagated and cultivated. It is believed that it has been a prevailing, though certainly an erroneous notion, that the sweet early kinds of grapes are the best to plant for the purpose of making wine in this country. And that most or all of the modern trials in this way have been made from vines brought from France. It is not doubted by the above writer, but that there are, among the abundant variety of grapes, peculiar sorts, which are by nature singularly suited to make wines in different climates and situations. Thus the different sorts of grapes propagated and grown in the Madeira and Canary islands, might not, it is thought, be found, if tried, to make good wines in France. It is hence concluded, that as the southern part of this island is almost on the verge of the vinous latitude, it should seem reasonable to suppose, that there would be the greatest probability of success from those kinds of grapes which have been known to thrive and prosper best in the most northern latitudes. On this account, therefore, the kinds of vines cultivated in Germany are recommended, and particularly the sort producing the grapes of which the Rhenish wine is made, in preference to any kind cultivated in France.

It is noticed above, that the early sweet kinds of grapes are improper for making of wine in this country: the reason of which is this, it is supposed, that though such grapes yield a sweet juice, it is not calculated to undergo fermentation in a proper manner. It is found by experience, that good *bodied*, or generous wines, can be made from grapes of an austere taste, and that too even before they are quite arrived at a state of maturity. But then wine from such crude grapes requires to be kept to a good age. The case is similar, it is said, in respect to apples. It is well known that the sweet kinds of them, which ripen in the summer months, are very unfit for making cyder. And that the noblest liquor of this sort, such as that of the styre and cockagee, is made from apples not much better than wildings. Mr. Loudon, however, remarks, in speaking of the culture of the vine in other intentions, that the general imperfection of English grapes is their defect of saccharine matter and want of sweetness. This is, perhaps, it is thought, in part owing to the humidity of the atmosphere, more than to its coldness, as very sweet grapes grow, and spirituous wines are made, in much colder and more northern latitudes than a great part of England. Another reason why the fruit of English vines possesses considerable acidity, is the general taste for large globular grapes, without regard so much to the delicacy of their flavour as the grandeur of their appearance. This species of vine does not produce delicious grapes in the hottest climates, it is said, and consequently should not be so generally cultivated in this. But the appearance in this intention is of little importance. The grapes most abundant in saccharine matter, are, it is said, always round, as those of the currant grape. It must be confessed, however, that the more exposed the vine is to the intense meridian sun, so much the sweeter will be the grape, and the greater the quantity of saccharine or spirituous juice that it will contain.

The sorts of vines most suitable for this purpose may probably be, the chassilas, or common white muscadine, the berries of which are not large, or very sweet. The morillon, noir hatif, a good sort of grape in this intention, which has a small round black berry, of a sugary juice, is much esteemed, as being early, ripening in September. The Malmsey muscadine, which somewhat resembles the above, the juice of which is very sweet, and of a high flavour, is a good bearer, and a fine grape. The black sweet-water has a small roundish berry, of a sweet taste; but which, being apt to crack, is not in much repute. Birds are fond of it. It ripens in the same month as the above. The small black cluster, which has small oval berries, and the leaves covered with a hoary down, is a very pleasant fruit. The early white grape from Teneriffe; the berries of which are of a middling size, and the flesh remarkably sweet and juicy: the Auverna, or true Burgundy grape, sometimes called the black morillon, which is an indifferent fruit for the table, but esteemed one of the best for making wine from: and the white sweet-water, which has a large berry of a white colour, and very agreeable juice, is esteemed an excellent grape, and ripens in the above month:—it is supposed that from some of these, and perhaps a few others, the cultivator may probably find a proper grape for cultivating in the intention of making wine in this country.

In regard to the culture of the vine with this design, as even the most southern parts of this island are but nearly on the verge of the vinous latitude, as has been seen, every possible advantage should be consulted and had recourse to in the formation and management of vineyards. Those abroad, it is said, are formed by planting the vines in rows, and by training them in a perpendicular direction. The first of the above writers would, however, in this country, greatly prefer the mode of training the vines in a lateral or horizontal form, similar to the method which is practised in Holland with vines in frames. There would, it is thought, be little difficulty in this method, as the vines might readily be trained along small poles, not thicker than those used for hops; these poles being fixed nearly parallel to the ground. Vines thus trained, it is apprehended, would derive many advantages, not only by means of warmth and shelter, but that they would most easily be protected also from spring-frosts,

frosts, by applying the boughs of trees, particularly those of the evergreen kind. The grapes too, it is observed, would be greatly benefited by the reflection from the soil of the ground underneath them.

It is suggested, that when vines are intended to be planted on the steeps of hills, and on the sides of rocks, the ground should be prepared and formed in the manner of steps, which it is particularly necessary should be lower at the inner angles, as without this the vine-plants would lose the advantage of such rains as fall hastily and perpendicularly. It is easy to conceive that much advantage would be gained from a situation thus formed, as the back would be nearly equal to a wall. And the expence attending the formation of the ground could not be very considerable. The work should be begun at the top, and the soil taken out be thrown down the hill. It would likewise be further beneficial to have a little good soil or earth put in at the angles, before the vines are planted.

In respect to the plants, they may be provided either by seeds, cuttings, or layers, but the two last are mostly the best methods. When they are raised from seed, after they have had a year's growth, they should be planted out, about the latter end of March, or beginning of the following month, against the poles or treillis to which they are to be trained, if from seeds ripened in this country; but when from such as are imported from the vine countries, too many should not be planted till their value be known. When they have been thus planted, they should be cut at the third eye, if strong, but at the second, if weakly; at the same time rubbing off the lower end with the finger and thumb.

When by cuttings, they should be chosen from shoots that are best ripened, and have the shortest joints; always having one or two joints of the last year's wood to them, cutting each perfectly smooth, and a little rounding at the lower end, and as near to a joint of the old wood as possible. The upper end too should be cut smooth, and sloping towards the treillis or poles. They should afterwards be trained as circumstances may direct. It has been advised too by some, that choice should be made of cuttings after a warm and dry season, when the wood ripens well; each cutting having two inches of the old wood with one eye of the new. When the old vines are pruned, there is mostly great choice, they should therefore be then selected of a middling size, and the wood round.

In raising vines for this purpose in the layer manner, a method very usually made use of is to lay the stools down in an open situation, in the same mode as for forest-trees and shrubs; though the best way, in the opinion of some, is to take layers from such vines as have been trained.

They should be cut so as to leave one or two strong eyes on each, and when the shoots begin to run, be trained to the treillis or poles. Those which have the strongest and most vigorous shoots should be selected and preserved for this purpose. They should afterwards be carefully trained and pruned, as circumstances may require, always considering that much of the goodness of the grapes in these cases depends upon the living wood being strong and well ripened.

In planting the grounds, the vines may be set in rows at suitable distances, according to the soil, situation, and mode of training which is to be practised, but mostly about three or four feet distant in the rows, and five, six, or more from row to row. The intervals between the rows are to be kept quite clean and free from weeds, by frequent hoeing and digging them over. After the vines have been thus raised, and carefully pruned and trained for three years, they mostly produce crops of fruit, which, when for wine, should be well ripened before it is used, especially in this country.

The mode of the culture of vines in Madeira may probably suggest some hints for their growth in the open grounds in this country. It is stated, that the best season for planting them there, is from the middle of the month of November to the end of February; that the slips or cuttings are made from a foot and a half to two feet and a half in length; they are set two feet in the ground, about three feet distant, in straight rows or trenches, about four or five feet asunder. After one trench is opened, and the earth taken out and laid on one side of it, so as to form a bank, the butt ends of the vines are put into the bottom of the trench, and the small ends extended sloping up the bank; the trench is then filled with earth dug from the sound land the depth of it, breaking the clods, taking out the stones, hawling all the earth towards the vines, and thus making a second trench, at the distance noticed above, from the first; proceeding to plant the whole vineyard or ground in the same manner. By this means the ground is lightened all over, as well as where it touches the vines, and is cleared of stones, the roots of trees, plants, shrubs, and grass, which are all carefully picked out. A vineyard or ground planted in this manner will, it is said, last there fifty or sixty years.

Afterwards the young vines are not pruned until they have been two or three years planted. The season for pruning is nearly as above; in doing which, no part of the vine is cut but the new shoots, which are cut off every year at the end of every second or third joint. The largest of these cuttings are saved for planting, and will keep for several weeks above ground; but if cut early, and not planted till late, it is better to cover the butt-end with earth.

The supporting of the vines, and other such matters, is done to the height of three or four feet, by sticking stakes in the ground from end to end of the rows, then lashing long slender poles near the heads of them; and across the poles are laid, both ways, reeds or canes, at the distance of two or two and a half feet, which are tied to one another, and to the poles where they cross, with split-willow twigs: these, if full grown and hard, will last two or three years. In the second or third year after planting, the vines are raised and fastened to the stakes and poles by means of twigs, and the branches spread open, and loosely tied to the poles or canes, so that they may not be too thick in some places and too thin in others.

In the third year after the vines have been planted out, they commonly produce a pretty good crop of grapes fit for making wine. In which cases, when they are almost come to their full size, they are gradually exposed to the sun, by frequently thinning the leaves till every branch lies open to the sun some part of the day. But if this should be done while the fruit is green, or, all at once, when nearly ripe, it would wither the grapes, and the juice would never be rich. The grapes are here to hang until they are very ripe, and many, on almost every branch, begin to turn to raisins, otherwise the wine will be weak, harsh, and rough, and without much flavour; hence it is evident the grapes should not be promiscuously gathered all at once, but two or three gatherings made, taking only what are ripe each time.

It is likewise found, that in soils which are hot, dry, and poor in quality, the culture of vines in this country in the open ground may be conveniently accomplished in another manner; as by their growth being greatly limited and restricted in such cases, their tendency to fruiting is considerable

ſiderably increaſed and expedited, they can, of courſe, be managed by being kept in a dwarf ſtate, in ſomewhat the manner of the currant, and in this way produce much fruit for the purpoſe of wine. It is a method which ſeems to have anſwered well in ſome caſes, and which is perfectly ſuited to many ſituations, where the vine might be cultivated for the making of wine in the ſouthern parts of this country. See VITIS and WINE.

It is evident from a variety of circumſtances, that the cultivation of the vine in the open ground of this country, in the view of procuring wine from the fruit, ſhould be more attended to than has hitherto been the caſe. In ſome ſituations it would probably afford a better profit and advantage than the hop, and with much leſs expence of cultivation; while in others it is almoſt the only plant that could be introduced with any chance of ſucceſs.

VINE *Gall-Inſect*, an inſect of the gall-inſect claſs, principally found on the vine, though capable of living on ſome other trees, and ſometimes found on them. It is much of the ſame ſhape, figure, and manner of life, with the other animals of this claſs; but differs from them in this, that as they lay their eggs all under their body, and continue abſolutely to cover them till they are hatched, theſe protrude them from their body, and they are found in prodigious abundance, lodged in a ſort of cottony or ſilken bags, all over the ſtalks and branches of the vines: the dead animal is ſometimes found covering them in part, but more frequently they are abſolutely naked, and often are ſo numerous, as to appear like thin cobwebs hung one over another all over the vine.

Theſe eggs might be eaſily miſtaken for thoſe of ſmall ſpiders; they always hatch well, and come to maturity on the vines they are found on; but if removed to others, they ſeldom come to any thing, which is very ſingular, ſince the gall-inſects of almoſt all other trees may be removed and propagated either on the ſame or on different trees.

Theſe vine-inſects are of the boat-faſhioned kind; but beſide theſe, there are ſome other ſpecies which lodge their eggs in a cottony neſt of the ſame kind. The common thorn affords a ſhorter and more convex kind than this does; theſe are a very ſmall ſpecies; others are ſomething larger; but the oak affords a ſort equal in ſize, if not exceeding thoſe of the vine; ſome of theſe are brown, others blueiſh, and others reddiſh; and there are ſome minute differences in their ſhape. Reaumur, Hiſt. Inſ. tom. iv. p. 61.

VINE-*Grubs*, a name given by ſome authors to the pucerons, or little inſects which are uſually of a green colour, and are found, often in prodigious numbers, ſticking to the leaves of trees and plants, and to their young ſtalks.

M. Reaumur has been very curious in his inveſtigation of the nature of this inſect; but the manner of propagating its ſpecies was never clearly obſerved, till Mr. Bonet diſcovered it.

Reaumur obſerves, that in every family of pucerons, there are ſome that have wings, and ſome that have not; and that, according to the uſual courſe of nature, the winged ones ſhould be males, and the others females; but, on the contrary, that both the winged and the unwinged vine-grubs are females, all being viviparous, and each kind producing a number of living young; ſo that the males of theſe pucerons were never diſcovered, even by that careful obſerver; nor could he ever find out what it was that impregnated the one and the other kind. He leaves us queries on this ſubject, whether there is no copulation among them? and whether they are all hermaphrodites, each having in itſelf the organs of both ſexes, as is the caſe of the river muſcles?

Mr. Bonet, in order to inform himſelf of the proceſs of nature in theſe creatures, brought up one of them in perfect ſolitude from its birth; he had an opportunity of obſerving it in the place where it was kept, and watched it very ſtrictly for many months together. At the end of twelve days this creature, without having had any copulation with a male, began to breed. She produced in the whole ninety-five young ones, all alive, and conſtantly under the eye of the obſerver. This experiment was repeated ſeveral times with the ſame ſucceſs: and, at length, repeated upon the young ones produced in this manner, and they were found to breed at the ſame period, and in the ſame manner with their parent, without having had any copulation with a male, as far as to the fourth generation.

A haſty obſerver would immediately conclude from this, that there was no copulation among the pucerons; but farther enquiry proves that this is not the caſe; for the ſame obſerver has found a ſpecies of them in which there is copulation; ſo that both the winged and the unwinged kinds are truly females, and the male is a ſmall fly, of a very different ſhape, as is the caſe in regard to many other inſects. This male is the moſt ſalacious creature imaginable, copulating a vaſt many times ſucceſſively, with the ſame, and with different females. As this is the caſe in regard to one ſpecies of this creature, it doubtleſs is ſo alſo in regard to the reſt, though that has not yet been obſerved: and the ſingularity ſeems to be this, that after the male has copulated with the female, ſhe not only becomes prolific, but her young ones are born ready impregnated, as far as the fourth generation; after which, probably, there is a neceſſity for the copulation with the male again.

There is another very ſingular obſervation alſo in the production of the young pucerons; the females are properly viviparous, and uſually bring forth live young; but they ſometimes produce only a ſort of fœtuſes, which are laid in a long ſeries one beſide the other, as the caterpillar eggs are laid by the butterfly; and they are left to hatch, as it were, afterwards, by the heat of the ſun. Phil. Tranſ. N° 469.

VINE or *Bine Hop*, in *Rural Economy*, a term often applied to the ſhoot of the hop-plant. After picking the hops, it is moſtly the beſt practice to tie up the vines, bines, or binds, into ſmall bavins while perfectly dry, in order to preſerve them in ſome way or other as fuel for different uſes, and to clear the ground for future operations. The work uſually coſts about ſixpence the hundred.

VINE-*Preſs*, a ſort of preſs and vat conſtructed for the purpoſe of ſqueezing and receiving the liquor from the grapes, where wine is to be made from them. It may be formed of different ſizes, as from ſix to nine feet ſquare, or more, according to the extent of the vineyard, being made of planks which are about eighteen or twenty inches in breadth, and two and a half or three inches in thickneſs, ſo fixed to a bottom of the ſame kind, or of greater thickneſs, that they may be capable of being preſſed cloſe to it, and to one another, at the corners, by the help of poſts or ſtuds, with wedges and levers; it being caulked, where neceſſary, in order to prevent the waſte of the liquor. On one ſide a ſpout is to be placed, on which a wicker baſket is to be hung during the operation, to ſtrain the liquor through as it runs into a tub, which is often put half way in the ground, to accommodate it to the height of the vat. When the grapes are gathered, they are thrown into the vat of the preſs,

prefs, and the fpout being ftopped, receive a gentle preffure; and then the fpout is opened, and the juice drawn off as long as it will run without further preffing: when the fpout is again ftopped, the grapes are again fubjected to a ftronger preffure, fomewhat in the manner of the cyder-prefs, and the liquor afterwards drawn off as before. In this manner the work proceeds until the liquor is wholly drawn off.

Thefe preffes are perfectly fimple in their nature, being merely fo contrived as to afford a proper degree of preffure, without doing too much injury to the grapes, which would probably hurt the flavour and quality of the wine. See Wine.

VINEÆ, in the *Roman Art of War*, were defenfive engines, compofed of wicker hurdles, laid for a roof on the tops of pofts, which the foldiers who went under it for fhelter bore up with their hands. Some fay that they had two roofs; the firft and lower of planks, and the upper roof of hurdles, to break the force of any blows, without difordering the machine. See Mantelets.

VINEGAR, Acetum, an agreeable, acid, penetrating liquor, prepared from wine, cyder, beer, and other liquors, and varying in hue from light red to brown ftraw-colour, malt vinegar being more highly coloured than that of wine: and of confiderable ufe, both as a medicine and a fauce: or, vinegar is a vegetable acid liquor, produced by the fecond degree of fermentation, or that which fucceeds the fpirituous, and is called the acid or acetous fermentation. Every liquor, which has completely undergone the fpirituous fermentation, is fpontaneoufly and neceffarily difpofed to the acid fermentation. Accordingly, every vinous liquor does continually tend to become vinegar, and is actually changed into it, fooner or later, according to circumftances; unlefs this change be prevented by fome obftacle to fermentation in general. If vinegar be long kept, and particularly if it be expofed to the air, it will become muddy and ropy, acquiring an unpleafant fmell, lofing its acidity, and putrefying. In order to preferve it for a longer time, it fhould be boiled for a few minutes, fo that the gluten may coagulate and feparate, on the prefence of which thefe changes depend, and alfo kept in well-corked bottles.

The word is French, *vinaigre;* formed from *vin*, *wine*, and *aigre*, *four*.

The method of making vinegar has long been kept a fecret among the people of that profeffion; who, it is faid, oblige themfelves to each other by oath not to reveal it; but, notwithftanding this, the Philofophical Tranfactions, and fome other late writings, furnifh us with approved accounts of it. Whatever be the materials ufed in the preparation of the liquor for producing vinegar, it is merely neceffary to admit air into the veffel in which it is kept, and to preferve it in a temperature fomewhat higher than that of the atmofphere in this climate, that is, from about 75° to 80°. When a liquor already fermented is ufed, it is alfo of almoft indifpenfable importance that yeaft, or fome other ferment, be added, in order to haften the fermentation, or elfe the change will be too gradual to obtain vinegar in perfection, and the firft acetified portion will turn mouldy before the laft has become four. But if the material employed has not undergone fermentation, the whole procefs of the vinous and preceding acetous fermentation will go on without interruption, with the fame ferment which firft fet it in action, as, *e. g.* in making vinegar from malt, or from fugar and water. It is neceffary alfo to ftop the procefs of the manufacture in that ftage of it, in which the acid has attained to its higheft degree of ftrength and perfection, after which the liquor would then fpeedily be deteriorated, the acetous acid would gradually difappear, and an offenfive mouldy watery liquor remain, with fcarcely any acidity. It depends upon the fkill and experience of the manufacturer to determine when his vinegar is in a fit ftate to be drawn off and clofely barrelled.

Vinegar, *Method of making Cyder.* The cyder (the meaneft of which will ferve the purpofe) is firft to be drawn off fine into another veffel, and a quantity of the muft, or pouze of apples, to be added; the whole is then to be fet in the fun, if there be a conveniency for the purpofe; and, at a week or nine days end, it may be drawn off.

Vinegar, *Method of making Beer.* Take a middling fort of beer, indifferently well hopped; into which, when it has worked well, and is grown fine, put fome rape, or hufks of grapes, ufually brought home for that purpofe; mafh them together in a tub; then, letting the rape fettle, draw off the liquid part, put it into a cafk, and fet it in the fun as hot as may be; the bung-hole being only covered with a tile, or flate-ftone; and in about thirty or forty days it will become a good vinegar, and may pafs in ufe as well as that made of wine, if it be refined, and kept from turning mufty.

Or, vinegar may be made thus: To every gallon of fpring-water, add three pounds of Malaga raifins; which put into an earthen jar, and place them where they may have the hotteft fun from May till Michaelmas; then preffing all well, tun the liquor up in a very ftrong iron-hooped veffel, to prevent its burfting: it will appear very thick and muddy, when newly preffed; but it will refine in the veffel, and be as clear as wine. Thus let it remain untouched for three months, before it be drawn off, and it will prove excellent vinegar.

Vinegar, *To make Wine.* Any fort of vinous liquor, being mixed with its own fæces, flowers, or ferment, and its tartar firft reduced to powder; or elfe with the acid and auftere ftalks of the vegetable from whence the wine was obtained, which hold a large proportion of tartar: and the whole being kept frequently ftirring in a veffel which has formerly held vinegar, or fet in a warm place full of the fteams of the fame, will begin to ferment anew, and conceive heat, and will grow four by degrees, and foon after turn into vinegar.

The remote fubjects of acetous fermentation are the fame with thofe of vinous; but the immediate fubjects of it are all kinds of vegetable juices, after they have once undergone that fermentation which reduces them to wine; for it is abfolutely impoffible to make vinegar of muft, the crude juice of grapes, or other ripe fruits, without the previous affiftance of vinous fermentation.

The proper ferments for this operation, by which vinegar is prepared, are, 1. The fæces of all acid wines. 2. The lees of vinegar. 3. Pulverized tartar; efpecially that of Rhenifh wine, or the cream or cryftals of it. 4. Vinegar itfelf. 5. A wooden veffel well drenched with vinegar, or one that has long been employed to contain it. 6. Wine that has often been mixed with its own fæces. 7. The twigs of vines, and the ftalks of grapes, currants, cherries, or other vegetables of an acid auftere tafte. 8. Bakers' leaven, after it is turned acid. 9. All manner of ferments, compounded of thofe already mentioned.

Vinegar is no production of nature, but a mere creature of art: for verjuice, the juices of citrons, lemons, and the like native acids, are improperly faid to be *natural* vinegars; becaufe, when diftilled, they afford nothing but vapid water; whereas it is the property of vinegar to yield an acid fpirit by diftillation.

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The wine which is generally converted into vinegar, and which for its cheapneſs is commonly employed for this purpoſe, is ſuch as has already become ſour; although the better and the more ſpirituous the wine, and alſo the more of the vinous ſpirit that can be retained in the vinegar, the better and ſtronger it will be. Becher ſays, in his "Phyſica Subterranea," that having digeſted wine in order to convert it into vinegar, in a bottle hermetically ſealed, he found, that although a longer than the ordinary time was required, the vinegar produced was much ſtronger than when free air is admitted. Mr. Cartheuſer alſo affirms, that the ſtrength of vinegar may be much increaſed by adding ſome aqua vitæ to the wine, before it is expoſed to the acetous fermentation. Nothing more ſeems requiſite in the preparation of good vinegar than to employ good wine, and to conduct the fermentation in the moſt advantageous method; the principal part of the operation being performed by nature.

VINEGAR *in France, Method of making*. The French uſe a method of making vinegar different from that above deſcribed. They take two very large oaken veſſels, the larger the better, open at the top; in each of which they place a wooden grate, within a foot of the bottom: upon theſe grates they firſt lay twigs, or cuttings of vines, and afterwards the ſtalks of the cluſters of grapes, without the grapes themſelves, or their ſtones, called the *rape*, till the whole pile reaches within a foot of the brim of the veſſels; then they fill one of theſe veſſels with wine to the very top, and half fill the other; and with liquor drawn out of the full veſſel, they fill up that which was only half full before; daily repeating the ſame operation, and pouring the liquor back from one veſſel to the other; ſo that each of them is full and half full by turns.

When this proceſs has been continued for two or three days, a degree of heat will ariſe in the veſſel which is then but half full, and will increaſe for ſeveral days ſucceſſively, without any appearance of the like in the veſſel which happens to be full during thoſe days; the liquor of which will ſtill remain cool: and as ſoon as the heat ceaſes in the veſſel that is half full, the vinegar is prepared; which, in the ſummer, happens on the fourteenth or fifteenth day from the beginning; but, in the winter, the fermentation proceeds much ſlower; ſo that they are often obliged to forward it by artificial warmth, or the uſe of ſtoves.

When the weather is exceedingly hot, the liquor ought to be poured off from the full veſſel into the other twice a day; otherwiſe the liquor would be over-heated, and the fermentation would prove too ſtrong; whence the ſpirituous parts would fly away, and leave a vapid wine, inſtead of vinegar, behind.

The full veſſel is always to be left open at top; but the mouth of the other muſt be cloſed with a cover of wood, in order the better to keep down and fix the ſpirit in the body of the liquor; for, otherwiſe, it might eaſily fly off in the heat of fermentation. The veſſel that is only half full ſeems to grow hot, rather than the other, becauſe it contains a much greater quantity of the vine-twigs and ſtalks than that, in proportion to the liquor; above which the pile riſing to a conſiderable height, conceives heat the more, and ſo conveys it to the wine below. Boerhaave's Elem. of Chemiſtry, part iii. p. 143, &c. Phil. Tranſ. vol. ii. p. 657.

There is another method, by which a very good vinegar is commonly made at Paris from the lees of wine. A quantity of wine-lees is put into a large tun, and worked up with wine ſufficient to render it very fluid. This is then put into cloth ſacks, which are arranged in a large iron-bound wooden vat, the heavy cover of which is laid over them, and ſerves as a preſs, that is gradually ſcrewed down till all the liquor is preſſed out. The wine, thus loaded with the extractive and tartareous matter of the lees, is diſtributed in large caſks ſet upright, through the heading of which a hole is cut, which is conſtantly left open. In ſummer theſe caſks are ſimply ſet in the ſun; but in winter they are arranged in a ſtoved room. The fermentation comes on in a day or two, and when it has got to its height, ſo much heat is excited, that ſometimes the hand can hardly be borne in it. In this caſe, it muſt be checked by a cooler air, and by adding ſome freſh wine to the caſks; and, indeed, it is in a due regulation of the heat that moſt of the practical ſkill of the maker conſiſts. The proceſs goes on in this way till the whole of the wine is thoroughly acidified, which requires about a fortnight in ſummer and a month in winter; after which the new vinegar is put into barrels, at the bottom of which are laid a good many chips of beech wood. Here it remains for about a fortnight, during which time it clarifies, and the clear part is then drawn off and kept in well-cloſed caſks. Theſe beech chips may be uſed over and over again for ſeveral years.

The natural colour of good wine-vinegar is a very pale red, but a higher colour is given, if deſired, by the addition of elder-berries.

There are ſeveral ſlight variations in the mode of making wine-vinegar, but which need not be detailed. They all conſiſt in exciting a freſh fermentation in wine, and keeping it up in a moderate degree till acetification is complete. Many refuſe parts of the vine are of uſe for this purpoſe, ſuch as the huſks, the ſour ſucculent twigs, the marc or cake left in the wine-preſs, and the like; and after they have once ſerved, they are ſtill more valuable, as the acid which they naturally contain, or which is evolved by them, is more readily produced.

Wine may alſo be converted to good vinegar without theſe additions, ſimply by adding wine, eſpecially when on the fret, to vinegar already made, and expoſing it to a proper heat. In this way many manufacturers proceed, keeping their caſks always full, by taking out of them at intervals about a third or fourth part, repleniſhing them with wine, and again bringing the contents to the ſtate of vinegar.

In this country vinegar is chiefly made from malt. The following is the uſual proceſs in London. A maſh of malt and hot water is made, which, after infuſion for an hour and a half, is conveyed into a cooler a few inches deep, and thence, when ſufficiently cooled, into large and deep fermenting tuns, where it is mixed with yeaſt, and kept in fermentation for four or five days. The liquor (which is now a ſtrong ale without hops) is then diſtributed into ſmaller barrels, ſet cloſe together in a ſtoved chamber, and a moderate heat is kept up for about ſix weeks, during which the fermentation goes on equally and uniformly till the whole is ſoured. This is then emptied into common barrels, which are ſet in rows (often of many hundreds) in a field in the open air, the bung-hole being juſt covered with a tile to keep off the wet, but to allow a free admiſſion of air. Here the liquor remains for four or five months, according to the heat of the weather, a gentle fermentation being kept up, till it becomes perfect vinegar. This is finiſhed in the following way. Large tuns are employed, with a falſe bottom, on which is put a quantity of the refuſe of raiſins or other fruit left by the makers of raiſin and other home-made wines, called technically *rape*. Theſe rape-tuns are worked by pairs; one of them is quite filled with the vinegar from the barrels, and the other only three-quarters full, ſo that the

ferment-

fermentation is excited more eafily in the latter than the former, and every day a portion of the vinegar is laded from one to the other, till the whole is completely finifhed and fit for fale.

Vinegar, as well as fruit-wines, is often made in fmall quantity for domeftic ufes, and the procefs is by no means difficult. The materials may be either brown fugar and water alone, or fugar with raifins, currants, and efpecially ripe goofeberries. Thefe fhould be mixed in the proportions which would give a ftrong wine, put into a fmall barrel, which it fhould fill about three-fourths, and the bung-hole very loofely ftopped. Some yeaft, or, what is better, a toaft fopped in yeaft, fhould be put in, and the barrel fet in the fun in fummer, or a little way from a fire in winter, and the fermentation will foon begin. This fhould be kept up conftant, but very moderate, till the tafte and fmell indicate that the vinegar is complete. It fhould be poured off clear and bottled carefully, and it will keep much better if it is boiled for a minute, cooled and ftrained before bottling.

In both the vinous and acetous fermentations, an inteftine motion, a fwelling, a hiffing noife, and an ebullition, may be perceived; but the heat produced by the former is fcarcely fenfible, whereas that produced by the latter is very confiderable. Moreover, the vapour which exhales from vinegar, during fermentation, is not noxious, like that of fermenting wine: on the contrary, as the acid of vinegar difengages itfelf, it feems to acquire more power to bind and retain the inflammable principle, which is the truly dangerous part of thefe vapours. Befides, vinegar does not depofit tartar as wine does, even though it has been made with wine that had not depofited its tartar; but the fediment of vinegar is a vifcid, oily, and very putrefcent matter; which is ufed to cover the grape-ftalks that are employed in the making of vinegar, in order to promote the fermentation. The acid of the grape-ftalks, which are wafhed clean and preferved to promote the fermentation of more vinegar, acts powerfully as a leaven or ferment. The cafks which have been ufed are alfo to be cleanfed from the vifcid matter juft mentioned, and kept for the fame ufe, as they are fitter for the purpofe than new cafks. When the acetous fermentation is finifhed, the nature and character of the liquor that has undergone it are totally changed. The tafte and fmell of wine are partly fpirituous and partly acid; though in good wine the latter is fcarcely perceptible: the tafte and fmell of vinegar are alfo acid and fpirituous; but the former quality prevails fo much, as almoft totally to conceal the latter. The properties of wine and vinegar prove, that the acetous fermentation unfolds in a very fingular manner the acid parts of wine, and intimately combines them with the inflammable fpirit; fo that by changing wine into vinegar, the ardent fpirit is no longer perceptible, fo that it cannot affect the head and intoxicate; and if it be diftilled, the firft liquor that rifes with a heat lefs than that of boiling water is not an ardent fpirit, as when wine is diftilled, unlefs the vinegar be too new, and the acetous fermentation has not been completely finifhed; but when old vinegar is diftilled, the liquor that firft rifes is a flightly acid phlegm, which contains the moft volatile, the moft odoriferous, and the moft fpirituous part of the vinegar.

When vinegar has run a little beyond the acetous ftate, and begun to enter on the putrefactive, the putrefaction may be ftopped by quenching a red-hot iron in the liquor; and the acid, which has been loft, may in fome meafure be reftored, by the addition of a little fpirit of wine, rye-bread, muftard-feed, &c. The putrefaction of vinegar may alfo be prevented, by racking it off from the feculencies, and keeping it in a clofe-ftopped veffel, in a cool place. However, fuch as has once fuffered a confiderable heat, cannot long be preferved from corruption.

In England, the excife laws relating to vinegar are as follow:

Every maker of vinegar for fale fhall take out a licence, for which he fhall pay 10*l.*; and fhall renew the fame annually ten days at leaft before the end of the year; on pain of 50*l.* 43 Geo. III. c. 69. Sched. (A.) 24 Geo. III. c. 41.

But perfons in partnerfhip need only take out one licence for one houfe.

By 43 Geo. III. c. 68. for all vinegar or verjuice imported, a certain duty fhall be paid *per* ton (quantity 252 gallons).

By 43 Geo. III. c. 69. Sched. (A.) for every barrel of vinegar, vinegar beer, or liquors preparing for vinegar, which fhall be brewed or made in Great Britain for fale, fhall be paid by the maker a certain other duty.

And upon every hogfhead of verjuice which fhall be made in Great Britain for fale, fhall be paid by the maker a certain duty.

And by 49 Geo. III. c. 98. a duty is impofed in lieu of all former duties of cuftoms.

By 10 & 11 W. c. 21. thirty-four quarts fhall be accounted a gallon of vinegar, according to the ftandard ale quart.

Every vinegar-maker fhall make entry with the officer of excife of the houfe or place where he intends to carry on the bufinefs; and whether he intends to make vinegar from malt or corn, or molaffes or fugar, or from any and what other materials. 26 Geo. III. c. 73.

Such officer may at all times by day and night (but if in the night, in the prefence of a conftable), enter into any places ufed by fuch perfons, and take an account of fuch liquors therein, and fhall make a report thereof in writing to the commiffioners, leaving a true copy thereof under his hand, with fuch maker, if demanded, in writing, under the penalty of 10*l.* 7 & 8 W. c. 30. 12 Geo. c. 28. 12 Ch. c. 24.

By 10 & 11 W. c. 21. no vinegar-maker fhall receive into his cuftody any liquors for making vinegar, nor deliver out any vinegar in cafks, or by the gallon, without notice firft given to the officer, unlefs from Sept. 29, to Mar. 25, yearly, between feven in the morning and five in the evening, and from Mar. 25, to Sept. 29, between five in the morning and feven in the evening; on pain of 50*l.*

On receiving fuch liquors into his cuftody, he fhall fhew the fame to the gauger before he mixes them with any other liquors, rape, or other materials; on pain of 20*l.*

If any vinegar-maker fhall, without giving notice at the next excife-office, or to one of the commiffioners, ufe any ftore-houfe, warehoufe, cellar, or other place, for making or keeping any vinegar beer, or liquor preparing for vinegar, he fhall forfeit 50*l.*

If any maker of vinegar for fale fhall conceal any vinegar, or liquor preparing for vinegar, from the view of the gauger, he fhall for every barrel forfeit 40*s.* 7 & 8 W. c. 30.

If fuch maker fhall, on demand made by fuch gauger in the day-time (or if by night, in the prefence of a conftable), refufe to permit him to enter his houfe, ftore-houfe, or other place ufed by him, and to take an account of the faid liquors, he fhall forfeit 15*l.*

No perfon carrying on the trade of a vinegar-maker from molaffes or fugar, or other materials, (except malt or corn,) fhall carry on (either alone or in partnerfhip) the trade of a diftiller

distiller or rectifier of spirits in the same premises, or within two miles thereof; and all entries made by such person shall be void. 26 Geo. III. c. 73.

All stale beer, returns of beer or ale, cyder, verjuice, or any other liquor proper to be made into vinegar, which shall be found in the possession of any common vinegar-maker, except such as are to be drunk in his family, and which shall be kept separate for that purpose, shall be deemed vinegar or liquors preparing for vinegar. 10 & 11 W. c. 21.

Every such vinegar-maker shall make entry once a month at the next excise-office of all liquors made within that month, and also within a month after such entry, shall clear off the duties, on pain of double duty. 12 Ch. II. c. 24.

All penalties and forfeitures are to be recovered, levied, and mitigated as by the excise laws. 43 Geo. III. c. 69.

VINEGAR, *Chemical Properties of the pure Acid of the different Kinds of.* See ACETOUS *Acid.*

The quantity of fixt alkaline salt which vinegar is capable of saturating, is one of the surest criterions of its strength. The best of the German vinegars, according to Stahl, saturate little more than $\frac{1}{16}$th of their own weight; the French vinegars, examined by Geoffroy, above $\frac{1}{14}$th; and some of them no less than $\frac{1}{11}$th; the common distilled vinegar of our shops about $\frac{1}{16}$th. By congelation, and distillation from alkalies, and from some metallic bodies, particularly copper, the acid may be so far concentrated as to saturate nearly equal its own weight. The best way of judging of the saturation, according to Dr. Lewis, is by trying the liquor from time to time with certain coloured vegetable juices, or on paper stained with them. For this purpose, a thick writing paper may be stained pale blue on one side with the blue preparation of archil, commonly called lacmus; and pale red on the other side, by a mixture of the same infusion with so much diluted spirit of salt as is just sufficient to redden it. If a small slip of this paper be dipped occasionally into the liquor to be tried, or a drop of the liquor be applied on both sides of the paper, the red side turns blue as long as any of the alkali remains unsaturated; the blue side turns red, when the acid begins to prevail; and no change at all is produced, when the saturation is complete. Where lacmus cannot be procured, the paper may be coloured with the juices of violets, iris, cyanus, &c. or with the blue juice pressed out from scrapings of the cortical part of common radish roots; with which it is sufficient to stain the paper on one side; this one colour discovering both acidity and alkalescence, the former changing it red, and the latter green.

The acetous acid differs essentially from all the others: from the native vegetable acid, in subtility and volatility; not being obtainable in the form of a concrete salt, which most, perhaps all, of the native ones are, and rising in distillation with a moderate heat, which very few of the native ones have been found to do: from the mineral acids, in its habitude to different bodies, and the nature of the compounds which it forms with them, being much weaker than the mineral acids: thus, whatever alkaline, earthy, or metallic substance the acetous acid be combined with, the addition of any mineral acid will disjoin them, the mineral taking the place of the acetous; neutral salts, composed of the acetous acid and fixed alkalies, dissolve totally and plentifully in rectified spirit of wine, whilst those composed of the same alkalies and mineral acids are not at all soluble in that menstruum: in this property, the acetous acid differs also from most, perhaps from all, of the acids of its own kingdom; and from all acids in general, in its peculiar odour.

The acid of vinegar dissolves all substances upon which other acids can act, and forms with them neutral salts, all which may be called acetous salts. With calcareous earth it forms salts, which in crystallizing shoot into silky ramifications and vegetations: these salts are named, from their earthy bases, salt of chalk, salt of crabs' eyes, &c. (See ACETITE *of Lime*, &c.) The solubility of calcareous earth in this acid, and its precipitability by that of vitriol, afford a ready method of discovering the sophistication of vinegar, said to be sometimes practised, with vitriolic acid. If a saturated solution of any calcareous earth, as chalk, made in strong vinegar, be added to such as is suspected of containing vitriolic acid, no change will ensue, if the vinegar was pure; but if it contained even a minute portion of that acid, the mixture will immediately become milky, and, on standing for a little while, deposit a milky sediment: if the calcareous solution be gradually dropt in, so long as it produces any milkiness or cloudiness, all the vitriolic acid will be absorbed by the chalk; and as this new compound is very sparingly dissoluble, nearly the whole of it will precipitate, so as to leave the vinegar almost pure. Its adulteration with vitriolic or sulphuric acid may also be detected by a solution of nitrate of barytes, which forms a white precipitate, when dropped into the suspected vinegar, insoluble in nitric acid, after having been exposed to a strong heat. With fixed vegetable alkali the acid of vinegar forms a very pungent and very deliquescent salt, called *Regenerated* TARTAR, or TERRA *foliata tartari*; which see. (See also ACETITE *of Potash.*) With fixed mineral alkali it forms a neutral crystallizable salt. With volatile alkali it forms an acetous ammoniacal salt, called *spirit of Mindererus*. See ACETITE *of Ammonia.*

Vinegar dissolves, among metallic bodies, zinc and iron; and the rest with difficulty, if at all. (See ACETOUS *Acid.*) United with copper, it forms a verdigris and crystals of Venus. With lead it forms cerusse, and salt or sugar of lead; dissolving it more easily when reduced to a calx than in its metallic state; boiled even with the glass of lead, or in the common glazed earthen vessels, in the glazing of which this metal is a principal ingredient, it extracts so much as to become strongly tainted with the pernicious qualities of the lead. Gold, platina, silver, and quicksilver, are not affected by vinegar in their metallic state; the two first have not been observed in any state to be affected by it. Silver precipitated from the nitrous acid, and thoroughly edulcorated with water, and mercury treated in the same manner, or changed by fire into a red powder, slowly and sparingly dissolve in it. Of the affinities of this acid to different metals, or its forsaking one to unite with another, few experiments have been made. Dr. Lewis observes, that it deposits lead and copper upon adding iron. (See *Tables of* AFFINITY.) It dissolves the vegetable inspissated juices, and several of the gummy resins, and extracts the virtues of sundry plants in tolerable perfection, superadding at the same time a virtue of a different kind. However, it excellently assists and coincides with some drugs, as garlic, squills, and ammoniacum; and in many cases, where this acid is principally to be depended upon, it may be advantageously impregnated with the flavour of certain vegetables. Vinegar very much concentrated, as the rectified spirit of Venus, or radical vinegar, being distilled with equal parts of highly rectified spirit of wine, furnishes a liquor which has all the essential characters of ether, and is called *acetous ether*. It was discovered by the count de Lauraguais. (See Hist. Acad. Scienc. Par. 1759.) It mingles equally with blood and its serum, and with most of the fluids of animals; not thickening or coagulating them, like the acids of

of the mineral kingdom, but tending rather, as Boerhaave justly observes, to attenuate and resolve coagulations. It is likewise, when taken internally, less stimulating than the mineral acids, and less disposed to affect the kidneys. Professor Cullen observes, that it is less liable to undergo changes in the first passages than the native vegetable acids, which have yet to go through the process of fermentation. The use of vinegar as a condiment, and as an antiseptic for pickling and preserving dead animal and vegetable matter, is well known.

Vinegar, *Medicinal Properties of.* This mild, unctuous acid is a medicine of great use in the different kinds of inflammatory and putrid distempers, both internal and external. Nothing is more extolled in many cases of putrefaction, and as an antidote against venomous bites, by Dioscorides and Hippocrates, than oxycrate; and vinegar, when applied to sores in animal bodies, is known to stimulate and resist putrefaction. When weak, it possesses the virtues of water; when strong, its effects approach to those of salts and acid spirit. Med. Ess. Edinb. vol. v. art. 24.

It is one of the most certain antiphlogistics and sudorifics in high fevers, and one of the best preservatives against pestilential and other putredinous contagions. Accordingly Boerhaave informs us, that Franciscus de la Boe Sylvius visited his patients in the plague with safety, by drinking first an ounce or two of vinegar. And it is now a common practice to wash and sprinkle the rooms of hospitals, the decks of ships, &c. with vinegar, in order to purify the air. Dr. Hales (Ventilators, part i. p. 46.) recommends dipping many cloths in vinegar, and hanging them up in all proper vacancies between the decks of ships, and in the chambers of sick persons, by which great quantities of vinegar would intermix and float in the air; and he found by an experiment, mentioned in his Statical Essays, vol. i. p. 266, that an air which passes through such cloths, could be breathed to and fro as long again, as the like quantity of air which was not impregnated with vinegar. Fainting, vomiting, lethargic and hysteric paroxysms, are likewise frequently relieved by vinegar, applied to the mouth and nose, or received into the stomach. Lethargic persons are often found to be excited more effectually by vinegar blown into the nose, than by the far more pungent volatile spirits. Boerhaave observes, that this acid counteracts, in a peculiar manner, the effects of spirituous liquors. The daily use of vinegar with food is salutary in hot, bilious dispositions, and where there is a tendency to inflammation or putrefaction. It is prejudicial to children, to aged, hysterical, and hypochondriacal persons; in cold, pale, phlegmatic habits, where the vessels are lax, the circulation languid, and the power of digestion weak. It tends in all cases, if used freely, to prevent corpulence. Hoffman suspects that it produces this effect by impeding the formation of chyle, or destroying the union of the unctuous and serous fluids of which chyle is composed; an effect common to all acids, as appears from their coagulating milk and artificial emulsions. Dr. Lewis observes, that he has known great corpulence reduced by the liberal use of vinegar, but not with impunity: diseases succeeding, which eluded the power of medicines, and proved at length fatal.

Combinations of vinegar with different earthy bodies, differ in virtue according to the nature of the earth. A solution of the aluminous earth in this acid is strongly styptic; of vegetable earth, or magnesia alba, bitterish and gently purgative: both these solutions are milder, and less ungrateful, than those of the same earths made in the mineral acids; and, though as yet unknown in practice, certainly deserves, as Dr. Lewis says, to be introduced. Solutions of different animal and the calcareous mineral earths are bitterish and subaustere, in various degrees, and supposed to act as mild resolvents, subastringents, or diaphoretics. Combinations of vinegar with fixed alkaline salts are useful aperients, diuretics, and cathartics. Dr. Lewis has known two drachms of the alkali, dissolved in as much vinegar as was sufficient to saturate it, occasion ten or twelve copious watery stools, and a plentiful discharge of urine, without griping or fatiguing the patient. Mixtures of alkali and distilled vinegar, evaporated to a dry salt, are kept in the shops; either in a brownish oily state, as obtained by simple evaporation, or purified to perfect whiteness, by gentle fusion or solution in water. These preparations are given in doses of ten or twenty grains as mild aperients, and to a drachm or two as purgatives and diuretics. See Tartar, *Regenerated*, Sal *Diureticus*, Terra *Foliata*, and Arcanum *Tartari*.

Combinations of vinegar with volatile alkaline salts, commonly made with distilled vinegar, added gradually to the salt, till the effervescence ceases, scarcely yield any solid salt; the saline matter evaporating with the watery fluid, or even before it: on distilling the mixture in a retort, a salt sometimes concretes about the sides of the receiver, but liquefies again as the vessels grow cold. These mixtures, called *spiritus Mindereri*, have little purgative virtue, but operate powerfully as aperients; by urine, if the patient walks about in the cool air; by perspiration or sweat, if kept warm in bed. They are principally made use of in this last intention, in doses of half an ounce; and, as they act without irritation, they have place in inflammatory cases, where the warm sudorifics, if they fail of exciting a sweat, aggravate the distemper. Vinegar and honey, or oxymel, of the consistence of a syrup, swallowed warm, is very good in many cases of sore throats arising from colds. A very important medicinal virtue has been attributed to vinegar, namely, that of curing the canine madness. See Hydrophobia, and Madness *from the Bite of enraged Animals*.

M. Buchoz, in a work, entitled "An historical Treatise of Plants growing in Lorraine, &c." affirms, that several successful trials have ascertained the efficacy of vinegar against the ill effects arising from the bite of mad dogs, when it is given in the quantity of a pound each day, divided into three doses; one to be taken in the morning, another at noon, and a third in the evening. Upon the whole we shall here observe, that vinegar, taken into the stomach, acts as a refrigerant, promotes diaphoresis and the discharge of urine; and is a powerful antinarcotic: externally its action on the living fibre is moderately stimulant and astringent. In inflammatory fevers it may be used to acidulate the ordinary beverage. It is given as a remedy in putrid diseases and scurvy; and is the most easily procured, and the best means of counteracting the fatal effects of overdoses of opium, and other narcotic poisons; for which purpose it should be administered in table spoonfuls, frequently repeated, after the stomach has been emptied by a proper emetic. It is employed as a glyster in obstinate costiveness; and externally, in the form of fomentation, or of lotion, is applied in burns, bruises, sprains, and chronic ophthalmia; and diluted with water, it is the best lotion for clearing the eye of small particles of lime, when they adhere to any part of the ball, or the lids. Its vapour is inhaled in putrid sore-throat; and diffused through sick rooms, with the view of neutralizing pestilential effluvia; but as a fumigation it has little efficacy. The dose of vinegar is fʒj to fʒij; and the quantity given in clysters f℥j to f℥ij. See on the subject of this article, Boerhaave's Elem. Chem. by Dallowe, part iii. p. 146, &c. Neumann's Chem. by Lewis, p. 458, &c.

Dict. Chem. Lewis's Mat. Med. Thomson's Lond. Disp. See also ACETIC *Acid*, ACETITE, ACETOUS *Acid*, and ACETUM.

VINEGAR, in *Rural Economy*, is an acid or cooling liquid that may be made use of with considerable benefit in different sorts of field labour, in mixture with water or other fluids, as quenching thirst very effectually, without stimulating or increasing the heat of the body too greatly. It has been stated, on the authority of a manuscript paper found in possession of sir William Pulteney on the use of vinegar, by the writer of the Corrected Report of the Agriculture of the County of Middlesex, that during the first American war, the interruption given by our cruizers to the trade of that country, and some other circumstances, prevented the inhabitants of it from procuring proper supplies of molasses for their distilleries, and a distress was experienced, particularly in harvest-time, from the want of rum to mix with water, which was the drink of their labourers. It is commonly known, the writer thinks, that cold water is dangerous, when used by persons heated with labour, or by any severe exercise; and yet it is necessary to supply the waste and exhaustion of perspiration in some mode or other. When rum or wine is added in small quantity to water, it may be used, even if cold, with little danger: it would, however, be safer, it is supposed, if a little warm water were mixed and employed in such cases.

On this account, Dr. Rush, of the same country, after making proper experiments on the subject, recommended in a publication, that instead of rum, which could not then be had, the labourers in harvest should mix a very small proportion of vinegar with the water they made use of as drink. Some years afterwards, in another publication, the same writer mentioned that the practice had been adopted, and had succeeded even beyond his expectations; indeed so much so, that in many places vinegar was still continued to be used, though rum could easily be had. The preference of vinegar to rum is accounted for in this manner: severe labour or exercise excites a degree of fever; and that fever is increased by spirits or fermented liquor of any sort; but vinegar, at the same time that it prevents mischief from drinking cold water during the heat and perspiration occasioned by exercise, allays the fever; and the labourers found themselves more refreshed and less exhausted at night, when vinegar was used instead of rum.

The exact proportion of the vinegar is not known by the writer, but it is supposed that it was not more than about a tea-spoonful to half a pint of water.

The discovery, it is said, was not altogether new, as the Romans used vinegar to mix with water for the drink of their soldiers.

The writer of the above agricultural report adds to this, that M. Denon, a celebrated French draughtsman, who accompanied their army while it was in Upper Egypt, experienced the advantage of vinegar mixed somewhat in this way in that burning climate, which he relates in this manner: "I cooled the heat of my blood with vinegar, which I mixed with water and sugar, and drank of it largely."

Independently of this, however, the same writer states, that the quality of water, which produces the ill effects above described to persons drinking it cold, when under any considerable degree of perspiration, may probably be corrected by the simple addition of skim-milk. The labourers in some districts of this kingdom, it is said, during harvest, make use of no other beverage than milk and water, which is found to allay the fever, and quench the thirst, much more than beer. At the same time, the labourers are glad when they can get beer or ale, though they confess that they are much sooner thirsty after drinking either, than they are after drinking milk and water, or it would seem than vinegar and water.

As it is necessary to have good and well-kept vinegar in this intention, as well as for some domestic and other purposes, it may be proper to consider the nature of it, and the means of preserving and preventing the decomposition and injury of it in any way. Where good vinegar is wanted, wines of good quality are necessary, as the best kinds of it are those that have been made from generous wines. The more spirituous the wine is, and the more of this vinous spirit that can be retained in the vinegar, of course the better and stronger it will be, and consequently the more fit for the above uses. In regard to the means of its preservation, they principally consist in defending it well against the action or influence of the external air, by keeping it in proper vessels, well closed, and placed in cool situations. Its alterations and injuries may likewise be further retarded, where necessary, by depriving it of a portion of the water which it contains; for which purpose, nothing more is wanted than to just let it boil for an instant; but the vessels which are employed in this kind of business should obviously not be made of copper. The process too, which has been proposed by some with a similar intention, is quite simple; it consists in filling with this acid glass vessels of a proper kind, which are to be then placed in boilers full of water; the water being in this case made to boil for a full quarter of an hour, after which the vinegar in the vessels is taken out, when it may be kept for several years without undergoing any alteration or decomposition. Distillation, too, has been advised as a means of preserving vinegar; but besides the circumstance of its being a tedious and difficult process, it is apt to deprive the acid of the agreeable smell and taste which are peculiar to it in its natural state, and which is always desirable, but more especially when for use in the above intention. And the same is the case with vinegar that has been concentrated by freezing. The acid by this simple operation becomes much stronger, and capable of being kept for a much greater length of time; but it acquires something of a burnt smell and taste, which render it unfit for being employed for many domestic purposes, as well as that above stated.

There is another manner of accomplishing this business by a saline substance, which is that of sea-salt, or muriate of soda, which is advised by some to be added to vinegar, as being able to preserve it, and which succeeds well enough in some cases, though it is not without its inconveniences; for the vinegars that contain this material grow turbid, and at length lose their primitive qualities. But though it may not succeed quite so perfectly as might be wished, it may still be employed in certain cases with advantage, especially if the quantity of salt that is necessary to be added to the vinegar be not in too large a proportion.

What respects the signs by which vinegar may be known to be good, adulterated, or spoiled, deserve considerable attention, as nothing is more common than to meet with vinegars that are of bad quality. Two causes principally contribute to their being in that state: the first of which is, that they have been manufactured or prepared with weak wines, or such as are already in a spoiled condition; the second, that they have been mixed with acrid substances, such as pimento and others; or that mineral acids, such as the sulphuric or muriatic, have been added to them. Nothing is, however, more easy than to detect such frauds and impositions, it being sufficient for the purpose to merely saturate a given quantity of potash with the vinegar which is suspected

ſuſpected of adulteration, and to compare the quantity of vinegar that has been obliged to be employed before a complete ſaturation could be obtained, with that conſumed in a ſimilar trial made with vinegar, the good quality of which is well known; and by evaporating or reducing the ſubſtance of the ſolution nearly to dryneſs afterwards, the nature of the material employed may be aſcertained. And as to the acrid vegetable ſubſtances that may have been mixed with it, they may be readily recognized by their taſte, which will be altogether different from that of the vinegar, and which will become the more perceptible, the more the acid has been concentrated or reduced by evaporation, or any other means.

It may be noticed in general, that vinegar which has not been adulterated, or which has not been ſpoiled by an incipient decompoſition, is readily and eaſily known by its penetrating acid taſte, its tranſparency, and its agreeable ſmell, which becomes ſtill more developed if ſome of the vinegar be rubbed between the hands, or in any other way.

In ſome of theſe modes, vinegar that is fit for uſe in the above intention, and for other purpoſes, may be readily known.

Vinegar is frequently alſo of much utility and advantage as an application in different caſes of bruiſes and ſlight ſwellings, ariſing from blows and other accidents among different kinds of live-ſtock or domeſtic animals.

Vinegar *of Antimony*, is an acid ſpirit, beſt made by diſtillation from the ore of antimony. See Antimony.

Its uſe is recommended in continued and malignant fevers.

Vinegar, *Aromatic*, of the Edinb. Ph., is prepared by taking of roſemary tops dried, and ſage leaves dried, of each 4 oz.; lavender flowers dried, 2 oz.; cloves bruiſed, 2 dr.; and diſtilled vinegar, 8 lbs.: macerating theſe ingredients for ſeven days, and filtering the expreſſed liquor through paper. The odour of this liquid, which is a ſolution of the volatile oils of the ſubſtance employed in vinegar, is pleaſant, pungent, and aromatic; and it is a grateful perfume in ſick rooms, but cannot be regarded as a prophylactic from fever, or other contagions.

The aromatic ſpirit of vinegar, originally invented and ſucceſſively improved by the late ingenious and reſpectable Mr. Henry of Mancheſter, is compoſed of highly concentrated vinegar, joined with the moſt pleaſant aromatic and efficacious antiſeptics, and may be kept unimpaired for any length of time, and in any climate. Its fragrant odour adapts it for affording relief in head-aches, faintings, &c. and renders it peculiarly grateful and refreſhing in crowded rooms, places of public reſort, and the apartments of the ſick. It is alſo ſaid to counteract the infection of contagious diſeaſes.

Vinegar, *Diſtilled*, is the ſpirituous acid of vinegar obtained by diſtillation. The proceſs of diſtilling vinegar is very ſimple. A quantity of good ordinary vinegar is put into a large cucurbit or ſtill, which ought to be made of ſtone-ware, and not of metal, as the acid of vinegar is capable of acting upon moſt metals. This cucurbit is ſunk in a deep furnace, ſo that five or ſix fingers' breadth only near its neck appear. The neck is to be carefully luted with clay all round the furnace, that the capital may not be heated too much. A capital and a glaſs receiver are then to be fitted, and the diſtillation is to be begun with a very gentle heat. The acid ſpirituous liquor paſſes by drops into the receiver. This liquor is white, tranſparent, penetrating, ſomewhat empyreumatic, and diſengaged from an acid, but not ſpirituous ſubſtance, and alſo from an extractive ſaponaceous matter, both which are contained in ordinary vinegar. Theſe latter ſubſtances remain in the ſtill with the colouring matter, and form together an extremely acid extract of vinegar. This reſiduum contains alſo ſome tartar, and by incineration yields much fixed alkali, as all matters belonging to vines, grapes, and wine do.

The thicker vinegar is, the leſs fit it proves for diſtillation, as there is always the greater danger of an empyreuma, or burnt ſmell, which would ſpoil the whole proceſs, and as it uſually in this caſe comes over oleaginous. And the pureſt white ſalt of tartar, ſaturated with this diſtilled vinegar, being afterwards ignited, turns black, and yields a ſmell extremely like that of crude tartar in the calcination. Shaw's Chemical Eſſays.

On the other hand, the more the vinegar is diluted immediately before diſtillation, the leſs danger there is of burning; and if the thick remaining maſs, when the thinner part is diſtilled from it, be again diluted with water, it may, by a ſecond diſtillation, be brought to afford an acetous ſubſtance; though this latter be by no means comparable to this former volatile part. This Vigani juſtly ſuſpects to be a circumſtance known but to very few. And even when the vinegar is diſtilled with the utmoſt labour and care, it ſtill has this effect in a higher degree, and contains an immenſe quantity of phlegm, in proportion to its acid ſalt.

In this caſe, the method of condenſation by freezing is of the utmoſt ſervice; firſt of all ſeparating the more aqueous part, and in the next place that which is ſomewhat acetous, though not comparable to what remains behind; ſo that, by this means, a moſt concentrated and ſubtle ſpirituous diſtilled vinegar may be produced, *viz.* by freezing the whole parcel of diſtilled phlegm and diſtilled vinegar together, a thing of great moment to the curious in the *chemia ſublimior*, and particularly to thoſe who underſtand Hollandus. And when the vinegar is froze without diſtillation, by this means you have a noble rob, or a rich concentrated vinegar, freed from its diſtillating aqueous and uſeleſs part. Vigani, Medull. Chem.

The Lond. Ph. directs the acetic acid to be diſtilled from a gallon of vinegar in a glaſs retort, placed in a ſand-bath, into a glaſs receiver kept cool; the firſt pint to be thrown away, and the ſix ſucceeding pints which are diſtilled to be preſerved. The diſtilled acetous acid of the Edinb. Ph. is prepared by diſtilling 8 lbs. of the acetous acid in glaſs veſſels, with a gentle heat, rejecting the 2 lbs. which firſt came over, as being too watery; and the 4 lbs. that follow will be the diſtilled acetous acid: the reſidue is a ſtronger acid, but too much burnt. The diſtilled vinegar of the Dub. Ph. is obtained by taking of wine vinegar ten pints, and diſtilling with a gentle heat ſix pints: the diſtillation is to be performed in a glaſs veſſel, and the firſt pint which comes over rejected. The ſpecific gravity of this acid is to that of water as 1006 or 10095 to 1000. (See Acetous *Acid.*) Darracq has aſcertained (Annales de Chimie, xli. 264.) that diſtilled vinegar differs from acetic acid, by containing ſome uncombined mucilage and extractive matter, but that the acids are otherwiſe the ſame. To this extractive it is owing, that when diſtilled vinegar is boiled with potaſh, the ſolution has a deep reddiſh-brown colour, and during evaporation carbonaceous matter is depoſited. Sulphuric acid is detected by a precipitate being produced on the addition of a ſolution of acetate of barytes; lead, by a ſolution of ſulphuretted hydrogen, forming a dark-coloured precipitate; and copper, by its aſſuming a blue colour, when ſuperſaturated with ammonia. The medical properties and uſes of diſtilled vinegar are the ſame with thoſe of common vinegar; but, being purer, and leſs liable

liable to spontaneous decomposition, it is fitter for pharmaceutical purposes. Thomson's Disp.

Vinegar, *Concentrated*. See Concentration.

Vinegar *of Lead*, is a liquor formed by digesting ceruss or litharge, with a sufficient quantity to dissolve it perfectly. This is called the *acetum lithargyrites*, and is prepared by digesting four ounces of litharge about three days in a sand heat, with a pint of strong vinegar, now and then shaking the vessel. The liquor, filtered, will receive a strong impregnation from the litharge, and will be found to have dissolved about one-tenth of it. When a saturated solution is required, the ceruss is preferred to the litharge. This vinegar is of the same nature with solutions of saccharum saturni, and when diluted with a large quantity of water, it abates external inflammations, the itching and other uneasinesses in cancerous ulcers; and before Mr. Goulard's practice, it was used for bathing inflammations in scirrhous tumours, to prevent their becoming cancerous. Inflammations and inflammatory tumours, in general, are dispersed by it. Dr. William Saunders has observed, that the acetum lithargyrites, or Goulard's extract, is not the same in its operation and powers as the saccharum saturni, as medical practitioners have generally supposed. In the preparation of the former, the acid is fully saturated with lead; but in that of the latter, the acid is in a much greater proportion to the lead. The former, when diluted by the purest distilled water, gives out a copious precipitation, which he finds, by experiment, to be ceruss. The latter remains dissolved in distilled water, and is, therefore, applied topically in a state more immediately active, both on account of its greater proportion of acid, and its preserving its solubility under high degrees of dilution. He has also found by experiment, that, by adding a very small proportion of distilled vinegar to the aqua saturnina of Goulard, the white precipitate is redissolved, and that the solution procured in this manner is more active, but less adapted to remove inflammation, and abate irritation, as a sedative, than the aqua saturnina itself. Dr. Saunders, however, is perfectly convinced that no degree of dilution of saccharum saturni will answer the many valuable purposes obtained from the use of the acetum lithargyrites. Water alone, in the case of the aqua saturnina, proves a precipitant of lead, by attracting the acid, and reducing the preparation to a state of ceruss, an intermediate state between lead and the saccharum saturni; so that ceruss diffused in water more nearly resembles the aqua saturnina of Goulard, than a solution of the saccharum saturni does. The saccharum saturni may be considered as an union of ceruss with vinegar; whereas Goulard's acetum lithargyrites is an union of lead with vinegar. See Percival's Phil. Med. and Exp. Ess. 1776. Append. p. 323, &c. See also Lead.

Vinegar *of Meadow Saffron, Acetum Colchici*, is ordered by the London College to be prepared by taking of the meadow saffron root (bulb) sliced, 1 oz.; of acetic acid, a pint; and of proof-spirit, a fluid-ounce; macerating the root with the vinegar in a covered glass vessel for twenty-four hours, then expressing, and setting the liquor aside, that the feculencies may subside, and adding the spirit to the clear liquor. This is given as a diuretic in ascites and hydrothorax, but is less to be depended on than the squill. The dose is from f ʒss to f ʒj, united with honey, or any bland fluid. See Colchicum and *Meadow* Saffron.

Vinegar, *Portable*, a name given by the chemists to a sort of vinegar-powder, or vinegar in a dry form. It is a preparation of tartar with vinegar, and is made in this manner: Take white tartar, half a pound; let it be carefully washed, then dried and powdered; infuse this powder in the strongest wine-vinegar; then dry it, and infuse it again, repeating this operation ten times: after this the dry powder is to be kept for use. At any time, a sort of extemporaneous vinegar may be made by dissolving a small quantity of this powder in any proper liquor.

Vinegar, *Prophylactic*. See Acetum *Prophylacticum*.

Vinegar, *Radical*, is a name given to the acid of vinegar, highly concentrated, by distilling verdigris, or crystals of verdigris, &c. See Acetic *Acid*.

M. de Lassone has lately found, that in the process of distilling verdigris for this purpose, a fluid escapes of the nature of those called by the ancient chemists *gas*, and by the moderns *fixed air;* and he also observed, that if the distillation be suspended the moment before the acid concentrated vapours appear under a white form, copperish flowers are obtained: before this period, the radical vinegar contains no copper; it only begins to contain some, when the copperish flowers, carried along by the acid vapours, mix themselves with this vinegar: if it is then rectified by a new distillation, these flowers are no more sublimed, and, therefore, a radical vinegar, exempt from copper, may be extracted from verdigris. The copperish flowers are in a high degree caustic, and may be considered as a violent poison. Hist. Acad. Sc. Par. 1777.

Vinegar *of Roses*. See Acetum *Rosatum*.

Vinegar *of Squill*. See Squill.

Vinegar, *Eels in*. The common opinion, from the discovery of eels in vinegar, that its sharpness to the taste was occasioned by these animals, caused the accurate Leeuwenhoeck to attempt a careful examination of it by the microscope.

Some of the strongest and sharpest vinegar, after having been exposed for some hours to the air, and afterwards examined by the microscope, entertains the sight with a number of corpuscles, called the salts of vinegar, which are acute at both extremities, and have many of them in the middle an oblong figure of a brownish colour, and others were altogether clear, pellucid, and bright as crystal. Others of these particles appeared of an oval figure, and some of the half of such a figure, hollowed like a small boat, or the half of a nut-shell. The more perfect figures, pointed at both ends, and pellucid, are so very minute, that some thousands of them are comprehended in a small drop.

These seem to be what affect the tongue with the acid sharpness, when we taste vinegar; and it is very probable, that beside these, minute as they are, there are multitudes of others, equally pointed, and infinitely smaller than these.

If vinegar be placed in an open glass, and suffered to remain some weeks, the surface of it will be found, on examination with good glasses, to be full of the same figures, double-pointed, and very pellucid; and in these, very often, there may be cavities plainly discovered; but examining the liquor a little deeper down, there are found numbers of minute eels; yet these, though minute, are prodigiously larger than the salt particles, and can never be supposed to be the occasion of the sharpness of vinegar to the taste, by any who rightly consider, since it is not all vinegar that contains them; nay, the much greater part of vinegar is wholly without them, and in winter they all die; yet vinegar is not less sharp at that season than in the summer.

Mr. Mentzelius was so lucky as to see these undergo their last metamorphosis, and change into small flies; and though this is a single instance, in regard to the microscopical world of animalcules, yet it is highly probable that the whole race of those, whose appearance in medicated fluids we have been so long puzzled to account for, may, like these, be the worm-state of some winged aerial insect, and have owed their

their origin, where we see them, to the eggs of parent flies, too small for our sight. Reaumur, Hist. Inf. vol. iv.

If vinegar be impregnated with crab's-eyes, or any other alkaline substance, which blunts, and in a great measure destroys its acidity, these double-pointed figures are no longer found in it, on a microscopical inspection; but in their places we find others with an oblong quadrangular base, from which they shoot up into pyramids, and appear like polished diamonds. These are also so very minute, that six thousand of them are computed to be contained in a drop of the liquor, no larger than two corns of barley; and these will be usually found all of the same size, or very nearly so, which is by no means the case with the other sorts of vinegar in its natural state. See *Microscopic* EELS.

VINEGAR-*Hill*, in *Geography*, an eminence near the town of Enniscorthy, famous for being a station of the rebels in 1798.

VINER'S ISLAND, a small island in the south-west part of James Bay, Hudson's Bay.

VINERY, in *Gardening*, a sort of garden erection, consisting of a wall twelve or fourteen feet in height, extending from east to west, furnished with stoves, and proper flues, with roof and lights of glass, covering a border of some extent; as ten feet or more in width. When vines are to be forced at an early season, upright glasses, two and a half or three feet in height, are often employed in front, to support the roof, and to admit sun and light to the border, which is frequently occupied with low-growing vegetables: but when they are not wanted early, a low wall will answer equally well. In forcing vines, the following dimensions are supposed to form an improved vinery, or house of this kind, and one that has been found to answer well in actual practice. In houses of this sort, if the wall be twelve feet high, the breadth ten feet, and the height of the upright wall in front three feet, the roof will form an angle of about forty-three degrees; which experience has shewn to be a suitable pitch for forcing vines with advantage.

These sorts of buildings may likewise be constructed on a plan somewhat similar to that of a single-pitted pine-stove, having the back wall fourteen feet high; the roof slanting, and covering an extent of about sixteen feet; with a flue running from east to west near the front wall. This is well suited, not only for grapes, but early crops of melons, strawberries, and other similar kinds of fruit.

To save the expence of glass; where there are peach-houses, the glass frames may also be employed for the vinery, when constructed with this intention, and good grapes may be obtained from vines trained against walls about six feet high, by means of melon-frame glasses, where a small slanting roof is made proper to receive them. But a small degree of fire-heat is of great advantage, and might be applied either by a flued wall, the flue running through the house, or by cast-iron pipes for the purpose.

These sorts of houses, Mr. Nicol remarks, vary exceedingly in their construction; and although some lay great stress on this article, (and there are extremes which ought not to be followed,) he is convinced the failure of success in the production of the grape, is much less a consequence of *bad* construction in the house, than in the preparation of the border, the choice of the kinds, and the general management. It has fallen to his lot to have the construction and management of three several and differently constructed grape-houses in the same garden, under his care for years, which have equally and uniformly produced excellent crops. This, in his opinion, is a proof of the necessity of a greater niceness in the formation of the border being observed, than in the construction of the house; the fire-place and flues excepted, which should always be particularly attended to.

He also thinks that the scite of a vinery is an object of such consequence to the welfare of the plant, and successful cultivation and production of well-flavoured fruit, that the greatest care should be taken in the choice of it. A gentle hill, having a south aspect, and considerable declivity that way, the soil a strong brown loam of two feet, over a bottom of dry sand, gravel, or soft clay, is, he thinks, the most desirable, and would be the least expensive of all situations. In this case the border requires no paving or draining; and admits of a proper mixture of sandy loam, vegetable mould, marle, and dung, by the removal of two feet of the natural bottom, with the natural soil, to form a border, perfectly adapted to the growth of the vine, in the following proportion; *viz.* one half strong brown loam, a quarter light sandy loam, an eighth vegetable mould of decayed tree-leaves, and an eighth stable-dung; to which add about a fiftieth part of shell-marle. This is the composition of the vine-borders at Wemyss Castle, none of which are less than four feet deep, and one (owing to the accidental situation of the house) is six. See FORCING, HOT-*House*, and STOVE. See also VITIS.

In order to form borders against these hot-walls in other cases, they should have the earth taken out two feet deep where the ground is dry, but in other cases one foot will be sufficient, as in wet soils the borders should be raised at least two feet above the level of the ground, to prevent the roots of the vines from being injured by the wet. The bottom of this trench should be filled with stones, lime-rubbish, &c. a foot and a half or two feet in thickness, which should be levelled and beaten down pretty hard, to prevent the roots from running downward. The trenches should be made five feet wide at least, otherwise the roots will, in a few years, extend themselves beyond the rubbish, and, finding an easy passage downwards, run into the moist ground, and be thereby much injured, or destroyed; but before the rubbish is filled into the trench, it is a better method to raise a nine-inch wall at that distance from the hot-wall, which will keep the rubbish from intermixing with the neighbouring earth, and also confine the roots to the border in which they are planted. This wall should be raised to the height of the intended border, and may be useful to lay the plate of timber of the frames upon, which will be necessary to cover the vines with when they are forced; and where the borders are raised to any considerable height above the level of the ground, these walls may preserve the earth of the borders from falling down into the walks; but in carrying them up, it will be proper to leave little openings, about eight or ten feet distant, to let the water pass off by. As soon as the walls are finished and thoroughly dry, the rubbish should be filled in, as directed above, when there should be fresh light earth laid upon it two feet thick, which will be a sufficient depth of mould for the vines to root in. The borders should be prepared in this manner at least a month or six weeks before the vines are planted, in order that they may have time to settle. See VITIS.

Improved and more economical modes of heating and steaming the plants in vineries have lately been had recourse to by Mr. Loudon and others, as by the ordinary fires, and the use of cast-iron plates, &c. Vineries have sometimes steam-vaults under the ground, for supplying occasional warmth to the roots of the vine plants. Houses of these kinds are sometimes called *graperies*, and *grape-houses*. See STOVE.

VINET, ELIAS, in *Biography*, a learned man of the sixteenth century, was born at Vinets, a village of Saintonge, and

and having gained a small sum of money by tuition, he went to Paris for the study of mathematics and improvement in classical literature. He was invited to Bourdeaux in 1541, and appointed to a professorship by Govea, principal of the college in that city. He accompanied his patron to Coimbra in 1547, but after his death returned to Bourdeaux, where he was appointed principal of the college in 1558. Having performed the duties of this office for twenty-five years, he was released from service in his advanced age, but retained his salary, and died in 1587, at the age of 78. Vinet edited various ancient authors; and besides his translations into French, he published some original works, such as "The Art of making Dials;" a treatise "On Moderation;" the "Antiquities of Saintes and Barbesieux," 4to. 1571; and "Antiquities of Bourdeaux and Bourg," 4to. 1574. Moreri.

VINEUIL, in *Geography*, a town of France, in the department of the Loir and Cher, on the Cousson; 3 miles E. of Blois.

VINEYARD, VINETUM, a plantation of vines. See VINE.

Vineyards were formerly common in England, but for a considerable time the cultivation of them has been altogether neglected. There was a famous vineyard at Bath, planted with white Muscadine and black cluster grapes, which, at one time, yielded sixty hogsheads of wine at a vintage, though, in 1721, it only yielded three hogsheads.

Bradley also mentions a small vineyard of a private person at Rotherhithe, consisting only of a hundred vines, which yielded at a vintage ninety-five gallons of wine, that had the true Burgundy flavour, as being made of that sort of grape, and exceeded any made on this side of Paris.

VINEYARD, in *Geography*, a town of America, in the district of Vermont, and county of Grand Isle; containing 338 inhabitants.

VINEYARD, *Martha's*. See MARTHA'S *Vineyard*.

VINEYARD, *New*, a township in the district of Maine, and county of Somerset; containing 484 inhabitants; 60 miles N.W. of Brunswick.

VINEYARD *Sound*, a narrow sea, on the north-west coast of Martha's Vineyard, separated from Buzzard's bay by Elizabeth islands.

VINFELD, a place of Westphalia, in the county of Lippe, near Horn.

VINGENNA, in *Ancient Geography*, a river of Gaul, which discharges itself into the Loire.

VINGER, in *Geography*, a town of Norway, in the province of Aggerhuus; 12 miles S.S.E. of Berga.

VINGORLA, a town of Hindoostan, in the country of Concan, where the Dutch had a settlement, from which they were driven by the natives in 1696. About ten miles to the west-north-west are some rocks, in the Indian sea, called Vingorla Rocks. The town of Vingorla is situated near the mouth of a river; 22 miles N.N.W. of Goa. N. lat. 15° 53'. E. long. 73° 27'.

VINHAES, a town of Portugal, in the province of Tra los Montes; 12 miles W. of Bragança.

VINJA CUTARIA, a town of Hindoostan, in Cutch; 16 miles S. of Tahej.

VINIE LAKE, a lake of Norway, in the government of Aggerhuus; 45 miles W. of Consberg.

VINIOLÆ, in *Ancient Geography*, a place in the isle of Sardinia, on the route from Portus Tibulis to Caralis, between Fanum Carisi and Sulci. Anton. Itin.—Also, a place of Spain, belonging to the Carpetani, between Accatucci and Mentesa Bastia.

VINITZA, in *Geography*, a town of Croatia; 12 miles W. of Varasdin.

VINIUS, in *Ancient Geography*, a river of Italy, in the vicinity of the town of Casinum, according to Varro, supposed to be now known by the name of Fiume di San Germano.

VINKATTY CHILLUM, in *Geography*, a town of Hindoostan, in the Carnatic; 10 miles S. of Nellore.

VINKENBOOMS, DAVID, in *Biography*, a landscape painter, born at Mechlin in 1578, was the son of an obscure painter in distemper. His landscapes, which are in the style of Roland Savery and of John Breughel, are sometimes adorned with stories from the Bible, but more frequently are convivial; being fairs or merry-makings. He ventured occasionally on history, with landscape backgrounds; such is the picture of Christ bearing his Cross, in the collection of the elector palatine, and of Christ healing the Blind, at Frankfort. His compositions are ingenious, but his touch is petite and hard.

VINKISH, the name of a disease in sheep. See VANQUISH.

UINMARSUCK, in *Geography*, an island near the coast of East Greenland. N. lat. 60° 40'. W. long. 45° 45'.

VINNA, a town of Hungary; 2 miles N.W. of Ungvar.

VINNAS, a town of Peru, in the diocese of Guamanga; 50 miles W. of Guanca Velica.

VINNEBERG, a town of Germany, in the bishopric of Munster; 10 miles N.E. of Munster.

VINNET, in our *Statutes*, is used for a flower or border, which printers use to ornament printed leaves of books. See VIGNETTE.

VINNIUS, (VINNEN,) ARNOLD, in *Biography*, an eminent jurist, was born in Holland in 1588, studied at Leyden, and taught the classics at the Hague till the year 1633, when he became law-professor in the university of Leyden. Whilst he occupied this office, he acquired distinction by various works of jurisprudence, in an elegant and ornamented style. The principal of his publications are, "Commentarius Academicus et Forensis in quatuor Libros Institutionum Imperialium," Amst. 1642, often reprinted, and particularly by Heineccius, with a preface and notes, Lugd. Bat. 1726, 4to.; "Notæ ad Institutiones," accompanying the preceding; "Introductio ad Praxin Batavam," &c. &c. He died at Leyden in 1657, or, as some say, in 1668. Moreri.

VINNY, in *Agriculture*, a term signifying mouldy and fusty, when applied to hay and other such substances. We have thus vinny hay, &c.

VINOVIA, VINONIA, or *Vicenia*, in *Ancient Geography*, a town of Great Britain, in the 1st Iter of Antonine, on the route from Vallum to Prætorium, is fixed at Binchester on the Were, in the bishopric of Durham, between Vindomora (Ebchester) and Cataractori (Cataract), on the south side of the river Swale. Ptolemy assigns it to the Brigantes.

VINOUS, VINOSUS, something that relates to wine; or that has the taste and smell of it.

All vegetables, by a due treatment, afford a vinous liquor; as corn, pulse, nuts, apples, grapes, &c.

A second fermentation, duly managed, turns any vinous liquor into an acetous one.

The proper character and effect of fermentation are, to produce either a vinous, or an acetous quality in the body fermented.

Some of our countrymen, bound on a voyage to the East Indies, having filled several casks with Thames water, to carry

carry along with them, observed an intestine motion in it when they came to the equator; and found it afterwards turned into a kind of vinous liquor, capable of affording an inflammable spirit by distillation. See PUTREFACTION *of Water*.

VINSOBRES, in *Geography*, a town of France, in the department of the Drôme; 4 miles S.E. of Nions.

VINTAGE, the crop of wine, or what is got from the vines each season.

The word is also used for the time or season of gathering or pressing the grapes.

In France, a decree or ordinance of the proper judge, and a solemn publication of it, are required, before the vintage can be begun.

VINTAIN, or BINTAIN, in *Geography*, a town of Africa, and capital of the kingdom of Fonia, on a river of the same name, which runs into the Gambia. This town is much frequented by Europeans for the purchase of wax, ivory, and skins.

VINTIMIGLIA, a sea-port town of Genoa, defended by a castle. It is the see of a bishop, under the archbishop of Milan; 13 miles N.E. of Nice. N. lat. 43° 48′. E. long. 7° 33′.

VINTIUM, in *Ancient Geography*, a town of the Nerusii, according to Ptolemy, recognized by inscriptions in honour of Gordian and Trajan-Decius, in which are read CIVIT. VINT. In the Notitia of the provinces of Gaul, Civitas Vintuntium is one of those of the Maritime Alps. In later times it was called Vincium, and this name is preserved in that of Vence.

VINUESA, in *Geography*, a town of Spain, in Old Castile; 13 miles N.W. of Soria.

VINUM, a liquor, or drink, popularly called *Wine*; which see.

VINUM, in *Medicine*, *Vinum Medicamentum*, is particularly applied to several medicated wines, *i. e.* medicinal preparations, of which wine is the basis. Wine, as a solvent, is liable to the objection of inequality of strength; and on account of its spontaneous decomposition by exposure to the air, it is more objectionable, this change being more likely to occur sooner when it is imbued with principles which tend to hasten the fermentative process. In order to obviate these disadvantages, Parmentier (Annales de Chimie, lii. 46.) proposes, that instead of preparing medicated wines in the usual way, the alcoholic tinctures well prepared should be added to wine in given quantities; by which means, he says, the preparations are less nauseous, and always of a determinate strength. By the general term wine, the London College designates sherry wine. These medicated wines should be kept in very well-corked bottles, and in a cool situation. Some of these are denominated from the ingredients used in them; some from the intentions with which they are prescribed; and some from their qualities, &c. Such are the

VINUM *Absinthites*, or *Wormwood Wine*; made of the great or little absinthium, by taking the apices, or tops, with the flowers, putting them in a sacculus, or bag, and suspending it in the middle of a vessel of wine; which, fermenting, extracts the taste, smell, and virtues, of the wormwood. See ABSINTHITES.

VINUM *Aloes*, *Wine of Aloes*, is prepared, according to the Lond. Ph., by rubbing eight ounces of extract of spiked aloes to powder with white sand previously freed from any impurities, and also rubbing two ounces of canella bark into powder, and on these, mixed together, pouring six pints of wine and two pints of proof-spirit; macerating for fourteen days, frequently shaking the vessel containing the mixture, and afterwards straining. The Dub. Ph. directs four ounces of socotorine aloes and one ounce of canella alba to be separately reduced to powder, and mixed together, and then to pour over it three pints of Spanish white wine, mixed with a pound of proof-spirit; then to digest for fourteen days, with frequent agitation, and lastly to strain the solution.

VINUM *Aloes Socotorinæ*, *Wine of Socotorine Aloes*, of the Edin. Ph., commonly called *Sacred Tincture*, is prepared by taking one ounce of socotorine aloes in powder, lesser cardamom-seeds bruised, and ginger-root bruised, of each a drachm, and two pounds of Spanish white wine; digesting for seven days, with frequent agitation, and then straining. This medicated wine is an excellent warm purgative and stomachic; and has been employed long and beneficially in cold phlegmatic habits, paralysis, gout, dyspepsia, and chlorosis; the dose is from f℥j to f℥ij as a stomachic, and from f℥j to f℥ij as a purgative.

VINUM *Aloeticum Alkalinum*, a form of medicine in the late London Dispensatory, intended to stand in the place of Helmont's elixir proprietatis. It is prepared in this manner: Take of bay fixed alkaline salt, eight ounces; aloes, myrrh, and saffron, of each an ounce; purified sal ammoniac, six drachms; white wine, a quart; infuse them together without heat for a week, or longer, and then filter the wine through paper for use.

VINUM *Amarum*, *Bitter Wine*, is an infusion of certain bitter, stomachic herbs, as gentian-root, juniper-berries, tops of centaury, orange and lemon-peel, in wine. This wine may be made by infusing for a week, without heat, gentian-root, and yellow rind of lemon-peel, of each one ounce, and two drachms of long-pepper, in two pints of mountain-wine, and straining out the wine for use.

The *Vinum Gentianæ Compositum*, vulgò *Vinum Amarum*, or compound wine of gentian, commonly called *bitter wine*, is obtained by slicing or bruising half an ounce of gentian-root, one ounce of cinchona bark, two drachms of orange-peel dried, one drachm of canella alba, and pouring upon them four ounces of proof-spirit, and, after twenty-four hours, adding two pounds and a half of Spanish white wine; then macerating for seven days and straining. This wine, newly prepared, is stomachic and tonic, but by keeping becomes acescent. The dose is from f℥iv to f℥vi, given two or three times a day. For other preparations, see GENTIAN-*Root*.

In complaints arising from weakness of the stomach, or indigestion, a glass of this wine may be taken an hour before dinner and supper.

VINUM *Anthelminticum*, *Anthelmintic Wine*, may be made by infusing, without heat, half an ounce of rhubarb, and an ounce of worm-seed, bruised, in two pints of red Port wine, for a few days, and straining off the wine. As the stomachs of persons afflicted with worms are always debilitated, red wine alone will often prove serviceable: it must, however, have still better effects when joined with bitter and purgative ingredients, as in the above form. A glass of this wine may be taken twice or thrice a day.

VINUM *Antimoniale*, *Antimonial Wine*, is made by digesting, without heat, half an ounce of glass of antimony, reduced to a fine powder, in eight ounces of Lisbon wine, for three or four days, occasionally shaking the bottle, and afterwards filtering the wine through paper. The dose of this wine varies according to the intention. As an alterative and diaphoretic, it may be taken from ten to fifty or sixty drops. In a larger dose it generally proves cathartic, or excites vomiting.

The *Liquor Antimonii Tartarizati*, or solution of tartarized antimony of the Lond. Ph., is obtained by dissolving a scruple of

of tartarized antimony in four fluid-ounces, of boiling distilled water, and then adding six fluid-ounces of wine. The *Vinum Tartritis Antimonii*, formerly *Vinum Antimoniale*, is had by mixing twenty-four grains of tartrate of antimony in one pound of Spanish white wine, so that the tartrate may be dissolved. These solutions are of equal strength; f℥j of either containing two grains of tartarized antimony. They are diaphoretic or emetic, according to the extent of the dose. In doses of ♏x to fʒj, in any proper vehicle, repeated every three or four hours, diaphoresis is usually excited; but this solution is principally used as an emetic for infants, a tea-spoonful being given every five minutes till it produces full vomiting. See ANTIMONY.

VINUM *Aromaticum*, is made by infusing aromatics, or spices, in new wine, or must.

VINUM *Benedictum*, *Blessed Wine*, is made of crocus metallorum and mars infused in wine. This was formerly a celebrated emetic, but is now almost out of use, on account of its roughness.

VINUM *Chalybeatum*, *Chalybeate Wine*, is thus prepared: Take filings of iron, four ounces; cinnamon and mace, of each half an ounce; of Rhenish wine, two quarts; infuse a month without heat, often shaking the vessel; then filter it off for use. Some superadd a reddish colour, by using a small quantity of cochineal.

Fine iron wire, cut in pieces, is more eligible than the filings, as we may always depend on the wire being pure iron; and as it exposes a larger surface to the fluid, it is more easily acted upon.

This wine is an excellent stomachic and aperient; it may be drank in the quantity of a common spoonful, or even of a moderate glass, once or twice a day, or mixed in apozems of the aperient vegetables.

In obstructions of the menses, this preparation of iron may be taken in the dose of half a wine-glass twice or thrice a day. Dr. Buchan says, that the medicine would probably be as good if made with Lisbon wine, sharpened with half an ounce of cream of tartar, or a small quantity of the spirit of vitriol.

The *Vinum Ferri*, or *Wine of Iron*, is by the Lond. Ph. directed to be prepared by mixing two ounces of filings of iron with two pints of wine, and setting the mixture aside for a month, occasionally shaking it; and filtering it through paper. The Dub. Ph. orders four ounces of iron wire cut in pieces, and four pints of white Rhenish wine; and directs to sprinkle a little of the wine over the iron filings, and exposing them to the air, until they be covered with rust, then to add the remainder of the wine; to digest for seven days, with frequent agitation, and lastly to filter. This is a vinous solution of tartrate of iron and potass, and when prepared as the London College directs, each pint contains about twenty-two grains of oxyd of iron. It is the least unpleasant of the preparations of iron; chiefly employed in chlorosis, and the relaxed habits of young females. The dose is from fʒj to fʒvj, given twice or thrice a day.

VINUM *Cydonites*, *Quince Wine*; made of slices of that fruit, steeped in must, or new wine.

VINUM *Emeticum*, *Emetic Wine*, is wine in which the glass or regulus of antimony, or crocus metallorum, has been steeped. See EMETIC.

This only takes a certain degree of efficacy from the matters; nor is it found any stronger at three months end, than at the end of three days. It purges both upwards and downwards.

VINUM *Enulatum*, *Elecampane Wine*, is an infusion of the root of that plant, with sugar and currants, in white Port. It cleanses the viscera, prevents disorders and obstructions of the lungs, and is good in asthmatic cases, cachexies, &c. See ELECAMPANE.

VINUM *Hippocraticum*. See HIPPOCRAS.

VINUM *Ipecacuanha* is prepared, according to the Lond. Ph., by macerating for fourteen days two ounces of the root of ipecacuanha bruised in two pints of wine, and filtering; according to the Ed. Ph., by macerating for seven days one ounce of the root bruised in fifteen ounces of Spanish white wine, and filtering through paper; and according to the Dublin Ph., by digesting for seven days two ounces of the bruised root in two pints of Spanish white wine, and then filtering. As an emetic, this is equally efficacious, and milder in its operation than antimonial wine, and, therefore, better adapted for infants: for this purpose, a tea-spoonful, or fʒss, is given for a dose, and repeated every ten minutes till it operates. In smaller doses it answers the same purposes as the powder, and is given in coughs, diarrhœa, dysentery, and other complaints in which a determination to the skin is indicated.

VINUM *Marinum*, *Sea-wine*, is made by casting sea-water on the grapes in the vat.

VINUM *Millepedum*. See MILLEPEDES.

VINUM *Nicotianæ Tabaci*, *Wine of Tobacco*, of the Edinb. Ph., is prepared by macerating for seven days one ounce of tobacco-leaves in one pound of Spanish white wine, and filtering through paper. This is the only form in which tobacco can be conveniently administered as an internal remedy. It is given to produce diuretic and antispasmodic effects in dropsies, colica pictonum, and ileus. The dose is from ♏x to ♏xxx, in any proper vehicle.

VINUM *Opii*, *Wine of Opium*, is obtained, according to the Lond. Ph., by taking an ounce of extract of opium, cinnamon bark bruised and cloves bruised, of each a drachm, and a pint of wine; macerating for eight days, and filtering. Mr. Ware introduced the use of this tincture as a local application in the second stage of ophthalmia, when the inflammatory symptoms have subsided, and the vessels of the conjunctiva remain turgid with red blood. Two or three drops are dropped into the eye every morning, until the redness be removed.

VINUM *Pectorale*, *Pectoral Wine*, is prepared by liquorice, saffron, coriander-seeds, caraway, anise, salt of tartar, penny-royal, and hyssop leaves, digested with Canary wine, and strained. It is a good expectorant, helping to deterge and cleanse the lungs, &c.

VINUM *Picatum*, *Pitched Wine*, is made of pitch infused in must.

VINUM *Rhei Palmati*. See RHUBARB.

VINUM *Rosatum*, *Rose Wine*, is made by steeping roses for three months in wine.

VINUM *Scilliticum*. See SQUILLS.

VINUM *Stomachicum*, *Stomachic Wine*, is prepared by infusing an ounce of Peruvian bark, grossly powdered, cardamom-seeds, and orange-peel, bruised, of each two drachms, in a bottle of white Port or Lisbon wine for five or six days, and straining off the wine. This wine is not only of service in laxity and debility of the stomach and intestines, but may also be taken as a preventive, by persons liable to the intermittent fever, or who reside in places where this disease prevails. It will be of use to those who recover slowly after fevers of any kind, as it assists digestion, and helps to restore the tone and vigour of the system. A glass of it may be taken two or three times a day.

VINUM *Strobilites*, denotes pine-apple wine.

VINUM *e Tartaro Antimoniali*, is made by dissolving tartar emetic in white wine, in the proportion of twenty-four grains to a pound.

Vinum *Viperinum*. See Viper-*Wine*.

Vinum *Essatum*, in *Chemistry*. See Essence *of Wine*.

Vinum *Extemporaneum*, a name given by Dr. Shaw and others to a sort of extemporaneous vinous liquor, made without fermentation, from the melasses spirit, lemons, water, and sugar, in the following manner. Some good sound lemons are to be cut in slices, rind and all, and put into a quantity of pure and fine melasses spirit; when they have stood in infusion three or four days, the liquor is to be strained clear off, and filtered: and having before prepared a very thin syrup of the finest sugar dissolved in spring-water, the two liquors are to be mixed together. The proportions of this mixture can only be hit by repeated trials; but when once found, it will be easy to continue them; and a vinous liquor will thus be prepared not inferior to many foreign wines.

VINZELA, in *Ancient Geography*, a town of Asia, in Galatia, belonging to the Tectosages. Ptolemy.—Also, a town of Asia, in Pisidia. Ptolemy.

VIO, in *Biography*. See Cajetan.

Vio, in *Geography*, a town of Spain, in Aragon; 11 miles N.W. of Ainsi.

VIOL, Viola, a musical instrument, of the same form with the violin, but larger, and having six strings; and struck, like that, with a bow.

The viol played with a bow was very early in favour with the inhabitants of France, and is very different from the *vielle* (which see), whose tones are produced by the friction of a wheel, which performs the part of a bow.

There are viols of divers kinds. The first and principal among us is the *base-viol*, called by the Italians *viola di gamba*, or the *leg-viol*; because held between the legs. (See Gamba.) It is the largest of all, and is mounted with six strings. Its neck is divided in half-notes, by seven frets fixed thereon. Its sound is very deep, soft, and agreeable. The tablature, or music for the base-viol, is laid down on six lines, or rules.

What the Italians call *alto viola*, is the counter-tenor of this; and their *tenore viola*, the tenor. They sometimes call it, simply, the *viol*: some authors will have it the lyra, others the cithara, others the chelys, and others the testudo, of the ancients. See Viola.

2. The *love viol*, *viola d'amore*, which is a kind of triple viol, or violin; having six brass or steel strings, like those of the harpsichord. This yields a kind of silver sound, which has something in it very agreeable. See Viol *d'Amour*.

3. A large viol, with forty-four strings, called by the Italians *viola di bardone*; but little known among us.

4. *Viola bastarda*, or bastard viol of the Italians; not used among us. Brossard takes it to be a kind of base-viol, mounted with six or seven strings, and tuned as the common one.

5. What the Italians call *viola di braccio*, arm viol; or, simply, *braccio*, arm; is an instrument answering to our counter-tenor, treble, and fifth violin. See Viola.

6. Their *viola prima*, or first viol, is really the counter-tenor violin; at least, they commonly use the clef *c-sol-ut* on the first line, to denote the piece intended for this instrument.

7. *Viola seconda* is much the same with our tenor violin; having the clef of *c-sol-ut* on the second line.

8. *Viola terza* is nearly our fifth violin; the clef *c-sol-ut* on the third line.

9. *Viola quarta*, or fourth viol, is not known in England, or France; though we frequently find it mentioned in the Italian compositions; the clef on the fourth line.

Lastly, their *violetta*, or little viol, is, in reality, our triple viol; though strangers frequently confound the term with what we have said of the *viola prima*, *seconda*, *terza*, &c.

Viol *d'Amour*, an instrument played with a bow, like the violin, of which it has the form. The only one we ever examined was many years ago in the hands of Giardini. It had but four strings, tuned fifths like those of the violin; but underneath these there were four metalline strings of small brass or iron wire, which were called sympathetic strings. These were never touched by the bow, but were caused to vibrate by the sound of the strings over them, when played upon by the bow.

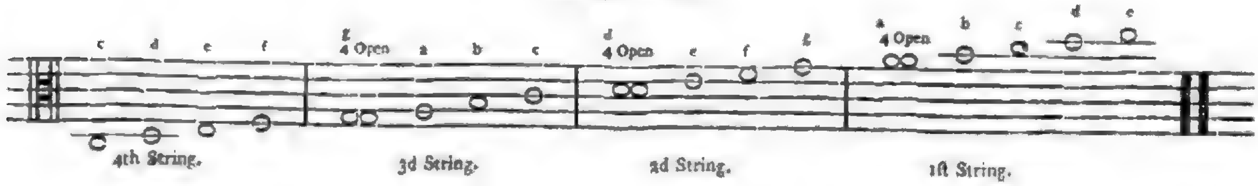
In the Supplement to the first Encyclopædia in folio, another viol d'amour is mentioned with twelve strings, six upon the great bridge, and six upon a smaller bridge below. The six inferior strings are of metal, and tuned octaves to the superior.

Viol *d'Amour* is also an instrument with seven strings, in the shape of a violin, but larger; it is played with a bow, but the finger-board is fretted. Its tone is sweet, but more feeble than the violin.

Viol is a term used by mariners, when a hawser, or strand-rope, is bound fast with nippers to the cable, and brought to the jeer-capstan, for the better weighing of the anchor, where the main-capstan proves insufficient.

VIOLA, and *Alto Viola*, the tenor violin. What the *contralto* is in vocal music, the *alto viola* is in instrumental. The same clef is used for both: the tenor on the third line. The instrumental tenor, or *viol da braccio*, as it is often called by the Italians, from its resting on the arm or shoulder, to distinguish it from the *viol da gamba*, which rests on the leg, is an octave above the violoncello, and five notes below the violin.

Scale of the Tenor.



These, with the semitones, are all the notes that were given to the tenor during the first fifty years of the last century, in the concertos of Corelli, Geminiani, and Handel; and the tenor was the instrument to which great violinists retreated, when the hand, and perhaps the eyes, failed. But during the last fifty years of the preceding century, when quartets, *à parti equali*, came into favour, the tenor was made an important instrument; and when played by a Hindmarsh, a Shields, a Stamitz, and by Giardini himself, was as much and as deservedly applauded as the violins and violoncello.

Viola, in *Botany*, the common and well-known Latin name

name of a charming flower, most probably originated in its Greek synonym ἴον. At least, the vague and forced etymologies of this word, for which Latin authors have ransacked their own language, prove it not to have come from thence. Nor are the explanations of the Greek much more satisfactory, though the fable of this plant having sprung up on purpose to be the food of the metamorphosed Io, is too poetical to be forgotten. The names of the Violet in modern languages all proceed from the Latin, or from the same source, whatever it may be. The poetry, the romance, the scenery, of every country, is embroidered with the violet, from Caledonia to Arcadia, and the very same individual species is, or has been, the object of homage in both those distant countries. Yet it must be remembered, that ἴον, *Viola*, and even the English *Violet*, are names of more wide-extended and indefinite application, than those of perhaps any other flower, even the Rose not excepted; so as to be nearly synonimous with the word *flower* itself; nor can any thing be more dissimilar from the true kind, or from each other, than the Calathian Violet, a GENTIANA, or the Dame's Violet, HESPERIS; the Dog's-tooth Violet, ERYTHRONIUM, or the Water Violet, HOTTONIA. (See those articles.)—Linn. Gen. 457. Schreb. 597. Willd. Sp. Pl. v. 1. 1159. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 244. Prodr. Fl. Græc. Sibth. v. 1. 145. Ait. Hort. Kew. v. 2. 43. Pursh 171. Juss. 294. Tourn. t. 236. Lamarck Illustr. t. 725. Poiret in Lam. Dict. v. 8. 623. Gærtn. t. 112.—Class and order, *Syngenesia Monogamia*, Linn. *Pentandria Monogynia*, Smith, Willd., &c. Nat. Ord. *Campanaceæ*, Linn. *Cisti*, Juss.

Gen. Ch. *Cal.* Perianth inferior, short, permanent, of five ovate-oblong, erect leaves, most acute at the summit, inserted above their base, which is obtuse; they are equal, but variously disposed; two of them subtending petal α, one each of the petals β and γ, and the fifth the two petals δ and ϵ together. *Cor.* irregular, of five unequal petals; of which petal α is at the top of the flower, the broadest and most obtuse of all, straight, looking downwards, emarginate, ending at the base in a horn-shaped, obtuse Nectary, projecting betwixt the calyx-leaves; β and γ are lateral, both alike, opposite, obtuse, straight; δ and ϵ are the lowest of all, both alike, larger than the two former, reflexed upward. *Stam.* Filaments five, very small, two of them adjoining to petal α, are furnished with two combined appendages, which enter the nectary; anthers converging, hardly connected, obtuse, with a terminal membrane to each. *Pist.* Germen superior, roundish; style thread-shaped, projecting beyond the anthers; stigma oblique, pointed or concave. *Peric.* Capsule ovate, triangular, obtuse, of one cell and three valves. *Seeds* several in each cell, ovate, polished, inserted into the valves. *Recept.* linear, running along the centre of each valve.

Obs. The *stigma*, in the Common March Violet, *V. odorata*, and its allies, is a simple reflexed hook; in the *tricolor*, or Pansy, tribe, it is a hollow knob, perforated at the summit, and more or less gaping occasionally. In the European species, the flower is always inverted; in the Indian ones, mostly erect; hence the different aspect of the two.

Ess. Ch. Corolla of five petals, irregular, spurred behind. Anthers somewhat connected. Capsule superior, of three valves and one cell. Calyx of five leaves, extended at their base.

Viola is a very numerous, almost entirely herbaceous, genus, for the most part of humble stature, though of great elegance. The *stem* is either trailing, or erect; sometimes wanting. *Leaves* alternate, rarely opposite, stalked, simple, crenate, or serrated, occasionally deeply divided. *Stipulas* various and remarkable. *Flowers* on simple stalks, blue, or rather purplish, whitish, or yellow; in one instance, at least, green; very often streaked in a radiant manner, like those of *Veronica*. The species abound in cold or cool countries, such as Europe and North America, though some are of tropical origin; but the habit of these latter is peculiar. One species has but two perfect stamens.

The discoveries of North American botanists have, of late, greatly enriched this genus. New Holland likewise has contributed several new and curious species; but of these we shall probably learn much more than is at present known, from Mr. Brown, whenever he continues his valuable *Prodromus*.

Two sections are most commodious for the distribution of the species, others, which have been proposed, proving problematical or obscure.

Sect. 1. *Without stems.*

1. V. *palmata.* Palmated Violet. Linn. Sp. Pl. 1323. Willd. n. 1. Ait. n. 1. Pursh n. 3. Curt. Mag. t. 535. (V. alba, folio securis amazoniæ effigie, Floridana; Pluk. Amalth. 208. t. 447. f. 9.)—Downy. Leaves heart-shaped, lobed in a hastate or palmate manner, more or less notched. Calyx-leaves lanceolate, smooth. Two lateral petals bearded at the base.—Native of North America, on dry hills and pasture ground, generally in a sandy soil. Perennial, flowering from April to June. *Pursh.* Hardy in our gardens, but rarely cultivated. The first *leaves* are kidney-shaped, serrated; the subsequent ones deeply and variously palmate, five-lobed, an inch and a half or two inches long, occasionally smooth. *Footstalks* erect, from two to four inches long. *Flower-stalks* rather taller, simple, and single-flowered, as in the whole genus, with a pair of opposite awl-shaped *bracteas* below the middle. *Flowers* an inch broad, light blue, whitish at the base, inodorous.

2. V. *pedata.* Cut-leaved Violet. Linn. Sp. Pl. 1323. Willd. n. 2. Ait. n. 2. Pursh n. 1. Curt. Mag. t. 89. Andr. Repos. t. 153. (V. virginiana tricolor, foliis multifidis, cauliculo aphyllo; Pluk. Phyt. t. 114. f. 7.)—Leaves pedate, smooth, with seven or nine lanceolate, nearly entire, lobes.—Native of dry sandy hills and fields, from New England to Carolina. Perennial, flowering in May and June. Rare in our gardens. According to Mr. Curtis, it should be planted in a pot of loam mixed with bog earth, plunged into a north border, and kept in a frame through the winter. The truly pedate *leaves* distinguish this species. The *flowers* are larger than the preceding, pale blue, with prominent orange-coloured tips to their *anthers*. Pursh mentions a variety, whose *petals* are very handsomely ornamented with a dark purple velvet at the bottom, similar to *V. tricolor*. This may be Plukenet's plant, so meanly figured, as usual with him.

3. V. *digitata.* Finger-leaved Violet. Pursh n. 2.—"Leaves palmate, tapering down into the footstalk, of five or seven undivided lobes."—Native of Virginia. *Leconte.* Perennial, flowering in May. *Flowers* pale blue. *Pursh.* May not this be nearly akin to the entire-lobed variety of the following?

4. V. *pinnata.* Wing-leaved Violet. Linn. Sp. Pl. 1323. Willd. n. 3. Ait. n. 3. Allion. Ped. v. 2. 97. (V. acaulis, foliis pinnatifidis; Gmel. Sib. v. 4. 101. t. 49. f. 4. V. n. 561; Hall. Hist. v. 1. 241. V. montana, laciniato folio; Clus. Hist. v. 1. 309.)

β. V. acaulis, foliis digitatis; Gmel. Sib. v. 4. 100. t. 49. f. 3. (V. montana, folio multifido; Bauh. Hist. v. 3. 544.)

Leaves in many deep, toothed or jagged, segments, tapering

tapering at their base, somewhat downy.—Native of Siberia, as well as of the mountains of Switzerland and Savoy, flowering in the spring. Cultivated by Miller in 1752, but we know not that it exists at present in the English collections. This species is rather smaller than *V. pedata*. *Leaves* generally as deeply divided, into about five segments, which are either unequally three-cleft, or pinnatifid, as well as jagged, and very narrow; or, in the variety β, lanceolate and only somewhat notched. Their ribs and edges are more or less downy. *Flowers* pale blue, with darker veins. Sometimes the *leaves* are less deeply divided, in a pedate manner, with bluntish lobes; but this variety does not seem confined to any particular country.

5. V. *sagittata*. Arrow-leaved Violet. Ait. n. 4. Willd. n. 4. Pursh n. 4.—Downy. Leaves oblong, acute, somewhat serrated; heart-shaped, cut, a little elongated, at the base. Calyx linear, smooth. Three lower petals bearded at the base.—On dry hills, from New England to Virginia. Perennial, flowering from April to June. Dr. Fothergill imported it from Pennsylvania in 1775. Linnæus confounded this species with his *hirta*, an European plant, distinguished by its uniformly heart-shaped, regularly crenate, *leaves*. The *sagittata* has remarkably elongated *leaves*, very obscurely serrated, except towards the base, where they are more or less deeply toothed. *Flower-stalks*, in our specimens, much shorter than the leaves; Mr. Pursh says longer. He describes the *flowers*, which we have not seen fresh, "blue; lower *petal* white towards the bottom, with purple veins; the rest longer, narrower, and white towards the base."

6. V. *dentata*. Toothed-leaved Violet. Pursh n. 5.—Smooth. Leaves oblong, acute; abrupt, dilated, with large ascending teeth, at the base. Flower-stalks shorter than the leaves. Calyx linear, smooth. Three lower petals bearded at the base.—Native of wet meadows and woods in Pennsylvania. Perennial, flowering in May and June. *Flowers* nearly the same as the last. *Pursh*. The *leaves* are of a hastate figure, two to three inches long, somewhat shorter than the preceding.

7. V. *betonicifolia*. Betony-leaved Violet. — Rather downy. Leaves linear-oblong, obtuse, crenate; heart-shaped, and slightly dilated, at the base. Flower-stalks taller than the leaves. Calyx lanceolate, smooth. Petals all bearded at the base.—Native of New South Wales. *Dr. White*. The *root* is somewhat woody, and doubtless perennial. *Leaves* the size of the last, but smooth or slightly downy only, regularly crenate throughout; not toothed, nor much dilated, at the bottom. *Stalks* generally, but not always, densely downy for an inch and a half below the *flowers*. *Calyx-leaves* broader than in the two last. *Petals* apparently light purple, not much veined.

8. V. *lanceolata*. Spear-leaved Violet. Linn. Sp. Pl. 1323. Willd. n. 5. Ait. n. 5. Pursh n. 6. Forst. Tr. of Linn. Soc. v. 6. 310. — Smooth. Leaves lanceolate, obscurely crenate; tapering at the base; rather shorter than the flower-stalks. Petals beardless. — In overflowed meadows, from Canada to Pennsylvania, flowering in June and July. Perennial. The *leaves* are an inch and half long; their *footstalks* nearly twice as much. *Flowers* the size of *V. palustris*, white; three of their *petals* marked with purple ribs.

9. V. *fusiformis*. Tap-rooted Siberian Violet. (V. acaulis, foliis lanceolatis, crenatis, hirsutis; Gmel. Sib. v. 4. 99. t. 49. f. 2.) — Leaves ovato-lanceolate, crenate, downy, longer than their footstalks, much shorter than the flower-stalks. Root tap-shaped. — Native of Siberia, in rather dry places, flowering in autumn. *Gmelin*. Mr. Forster, in Tr. of Linn. Soc. v. 6. 310, has long ago pointed out this Siberian *Viola* as a distinct species from the North American *lanceolata*. We have never seen a specimen. The *leaves* in the figure cited are above an inch long; the *flower-stalks* near three inches, with two lanceolate *bracteas*, rather above the middle. *Flowers* larger than the last, blue or purplish.

10. V. *microphylla*. Small-leaved Yellow Violet. Poiret in Lam. n. 11.—Leaves ovato-lanceolate, crenate, somewhat downy, shorter than their footstalks. Root scaly. Flower-stalks taller than the leaves, smooth, with two awl-shaped bracteas near the top.—Gathered by Commerson on hills on the Patagonian coast, in the straits of Magellan. *Poiret*. *Leaves* several, radical, four or five lines long, and three broad. *Stipulas* two, narrow, membranous, at the base of each *footstalk*. *Flowers* yellow; *lip* twice the size of the other petals, emarginate, marked with purple lines, and ending behind in a short blunt *spur;* two lateral *petals* bearded at the base. This seems nearly akin to *V. magellanica* of Forster; see n. 18.

11. V. *pygmæa*. Dwarf Linear-leaved Violet. Poiret in Lam. n. 18. — Leaves sessile, linear, entire, somewhat fleshy, smooth, rather longer than the flower-stalk. Root tap-shaped.—Gathered in Peru, by Joseph de Jussieu. A very distinct species, according to the description of Poiret, hardly an inch high, with thick fleshy *roots*, crowned by tufts of narrow, linear, obtuse *leaves*, having scaly, oval, pointed *stipulas* at their base. *Flowers* small, drooping, pale blue, striated; the *petals* obtuse, scarcely longer than the sharp, lanceolate, white-edged leaves of the *calyx*.

12. V. *obliqua*. Oblique-flowered Violet. Ait. n. 6. Willd. n. 6. Pursh n. 8.—Smooth. Leaves heart-shaped, acute, flattish, acutely crenate, taller than the flower-stalks. Flowers erect. Petals obliquely twisted; the lateral ones narrowest and longest, bearded below the middle.—In shady wet places, from Pennsylvania to Virginia, flowering from April to June. Perennial. *Flowers* white, with purple and yellow veins. *Pursh*. *Leaves* an inch and half long; their *stalks* twice or thrice as much. *Flower-stalks* thread-shaped, usually the length of the footstalks. *Calyx* smooth. *Petals* oblong-ovate, straw-coloured; blue at the base; the uppermost half an inch long, with blue streaks, beardless; two lateral ones rather narrower and longer, bearded below their middle; two lowest as long as these, and rather broader, beardless. *Solander in Ait. H. Kew.*

13. V. *cucullata*. Hollow-leaved Violet. Ait. n. 7. Willd. n. 7. Pursh n. 10. Curt. Mag. t. 1795.—Smooth. Leaves heart-shaped, acute, serrated; involute at the base. Petals twisted, obtuse; the lateral ones bearded at their lower part.—Common in North America, in grassy wet places, flowering in May and June. A hardy perennial with us. *Root* tuberous. *Leaves* rather larger than our Sweet Violet, erect and smooth, remarkably rolled in at their base, so as to form a sort of cup. *Flowers* also larger than in that species, light purplish-blue, with dark veins; the centre white. The late Mr. Curtis, as Dr. Sims records, observed the spring *flowers* to bear no seed; though later ones, on very short stalks, without *petals*, were all prolific. Such is, more or less, the case with many of this section, as well as with the caulescent *V. mirabilis*, hereafter described.

14. V. *sororia*. White-rooted Violet. Willd. Hort. Berol. t. 72. Ait. n. 8. Pursh n. 11.—Leaves heart-shaped, crenate, obtuse; downy beneath. Petals oblong; the lower one bearded at the base.—Found in overflowed meadows of Pennsylvania, and other parts of North America.

America. Perennial, flowering from April to June. *Flowers* blue, white at the bottom; lower *petal* veined. *Pursh.* This species was sent to Kew garden, in 1802, by the late Mr. Masson, during his last botanical expedition to North America.

15. V. *primulifolia.* Cowslip-leaved Violet. Linn. Sp. Pl. 1324. Willd. n. 8. Ait. n. 9.—Smooth. Leaves ovate-heartshaped, obscurely crenate, obtuse, running down into the bordered footstalks. Calyx naked.—Native of Pennsylvania and Virginia, flowering in the spring. We have specimens from the late Dr. Muhlenberg, exactly agreeing with those of Linnæus. The *root* seems to be perennial and creeping. *Leaves* an inch and half long, on *footstalks* half as long again, and sometimes slightly downy, furnished with a narrow, leafy, entire border, gradually dilated upwards, till it unites with the leaf; hence the foliage of this plant is compared by Linnæus to that of the Cowslip, not the Primrose. The *flowers* are rather small, pale flesh-coloured or blueish; the lower *petal* strongly and copiously veined with dark purple; the lateral ones bearded at the base. *Calyx-leaves* linear-lanceolate, unequal in breadth, always, as it appears to us, quite smooth.

16. V. *fimbriatula.* Fringed Violet. (V. primulifolia; Pursh n. 9.)—Leaves heart-shaped, crenate, fringed, acute, running down into the bordered footstalks; most downy beneath. Calyx mostly ciliated.—Sent from North America, by Mr. Francis Boott, as the *V. primulifolia* of Pursh, with whose definition it agrees. That author speaks of it as growing on dry hills, from Canada to Virginia; perennial, flowering from April to June. The appearance of this plant is very different from the last. *Root* rather tuberous, not creeping. *Leaves* more heart-shaped and acute, fringed, and somewhat downy on both sides, their length, like that of their bordered *footstalks*, about an inch. *Flowers* numerous, blue, thrice the size of the preceding, with obovate *petals*, two of which are loosely bearded at the base. *Calyx-leaves* lanceolate, unequal in breadth, distantly but strongly fringed; occasionally naked.

17. V. *hirta.* Hairy Violet. Linn. Sp. Pl. 1324. Willd. n. 9. Fl. Brit. n. 1. Engl. Bot. t. 894. Curt. Lond. fasc. 1. t. 64. Fl. Dan. t. 618. (V. martia major hirsuta inodora; Moris. sect. 5. t. 35. f. 4.)—Leaves heart-shaped, hairy as well as their footstalks. Calyx-leaves obtuse. Lateral petals marked with a hairy central line.—Native of groves and bushy places, principally on a chalky lime-stone soil, in various parts of Europe, from Denmark to mount Athos, flowering in April and May. The whole herb is of a hoary green, clothed with soft pubescence. *Stem* none, except very short leafy scyons, which do not throw out roots, but compose a dense leafy tuft, lasting many years if undisturbed. *Flower-stalks* taller than the leaves, smooth, with a pair of lanceolate smooth *bracteas* below their middle. *Flowers* light greyish-blue, streaked with black, scentless. *Calyx* smooth. *Anthers* distinct. *V. campestris*, Marsch. à Bieb. Taurico-Caucas. v. 1. 171. may possibly be a sweet-scented variety of this.

18. V. *magellanica.* Magellanic Violet. "Forst. Comment. Soc. Goett. v. 6. 41. t. 8." Willd. n. 10.—"Stem none. Leaves kidney-shaped, wavy, villous."—Native of boggy situations, in Terra del Fuego. Perennial. *Flower* large, yellow, streaked with brown veins. *Forster.* Perhaps not distinct from *V. microphylla*, n. 10. We have not seen either.

19. V. *papilionacea.* Butterfly Violet. Pursh n. 12.—"Leaves triangular-heartshaped, acute, crenate, somewhat hooded, nearly smooth. Flower-stalks the length of the leaves. Petals obovate: three lower ones converging, bearded below the middle; two upper reflexed."—Near Philadelphia, in wet places. Perennial, flowering in May and June. *Flowers* blue, elegantly striated, bearded with yellow down. *Pursh.*

20. V. *clandestina.* Subterraneous Violet. Pursh n. 13. (V. rotundifolia; Michaux Boreal.-Amer. v. 2. 150? Muhlenb. Cat. 26?)—"Nearly smooth. Leaves almost orbicular, bluntish; heart-shaped with converging lobes at the base; with blunt glandular serratures at the margin. Flowers from lateral shoots. Petals linear, hardly longer than the calyx."—On the high mountains of Pennsylvania, in shady beech woods, among rotten wood and rich vegetable mould. Perennial, flowering from June to September. This singular species differs from all the rest, in producing its *flowers* as it were under ground, they being always covered with rotten wood or leaves. They are very small, of a chocolate-brown. The *seed-vessel* buries itself still deeper in the ground, and is large in proportion to the plant. The inhabitants know it by the name of *Heal-all*, being used by them to cure all kinds of wounds or sores. *Pursh.*

21. V. *palustris.* Marsh Violet. Linn. Sp. Pl. 1324. Willd. n. 11. Fl. Brit. n. 3. Engl. Bot. t. 444. Abbot Bedf. 190. t. 3. Curt. Lond. fasc. 3. t. 58. Fl. Dan. t. 83. (V. palustris rotundifolia glabra; Moris. sect. 5. t. 35. f. 5.)—Leaves kidney-shaped, smooth. Root creeping. Two lateral petals bearded.—Native of mossy bogs, in the colder parts of Europe, flowering in April or May. More frequent in Scotland, and the north of England, than in the south, growing on the moist parts of sandy or turfy heaths. The *root* is thread-shaped, rather fleshy, creeping considerably. *Herb* smooth. *Leaves* shining, obscurely crenate, generally abrupt, or emarginate, often purple beneath, on *stalks* exceeding their own length. *Flower-stalks* longer than the leaves, with a pair of lanceolate *bracteas* about the middle, not always below that part. *Flowers* scentless, smaller than the Sweet Violet, of a very pale blue or flesh-colour, streaked partly with red, partly with dark purple; the two lateral *petals* marked at the lower part with a central downy line. This is a very pretty species, not easily to be cultivated. Ray's V. rubra striata Eboracensis, *Syn. ed.* 3. 365, is scarcely to be deemed a variety.

22. V. *blanda.* White-flowered American Violet. "Willd. Hort. Berol. t. 24." Ait. n. 12. Pursh n. 7.—Leaves heart-shaped, bluntish, crenate, smooth. Root creeping. Petals beardless.—In wet places, or boggy meadows, from New York to Carolina. Perennial, flowering from April to June. *Flowers* yellowish-white; lower *petal* marked with blue stripes and veins. *Pursh.* Nearly akin to the last, but the *leaves*, though variable in acuteness, are not at all kidney-shaped. The *roots* are very slender. *Petals* marked with similar veins to the foregoing species, but they appear not to be hairy in any part.

23. V. *hederacea.* Ivy-leaved Violet. Labillard. Nov. Holl. v. 1. 66. t. 91.—Leaves heart-shaped, wavy, nearly smooth, running down into the slightly bordered footstalks. Root creeping. Flower-stalks solitary, much taller than the leaves. Two lateral petals bearded below the middle.—Found by Labillardiere, at the Cape of Van Diemen. We have the same, or a very similar species, from New South Wales, in which the *flowers* seem to be pale pink, with a purple eye; the *petals* obovate, veiny, the lateral ones densely hairy in their lower half. The *leaves* however are larger, more kidney-shaped, and more toothed, than in the figure above cited; but it may be only a luxuriant variety. M. Labillardiere describes his with a trailing *root*, or *runners*, throwing up here and there solitary tufts of numerous heart-shaped, or rather kidney-shaped, long-stalked *leaves*, half an inch

inch broad, with copious awl-ſhaped radical *ſtipulas*. Each tuft bears one *flower-ſtalk*, three inches high, with two awl-ſhaped *bracteas* towards the middle, and one ſmall erect *flower*, the ſize of *V. paluſtris*, whoſe two lateral *petals* are villous near the baſe. The *calyx-leaves* project but very little at the baſe, which is the caſe with our ſpecimens above-mentioned, from New South Wales, and indeed with *V. paluſtris* and *blanda*. Yet they all have enough of that character to prove them true *Violæ*.

24. V. *odorata*. Sweet Violet. Linn. Sp. Pl. 1324. Willd. n. 12. Fl. Brit. n. 2. Engl. Bot. t. 619. Curt. Lond. faſc. 1. t. 63. Fl. Dan. t. 309. Bulliard t. 169. Renealm. Spec. 141. t. 140. (V. nigra, ſive purpurea; Ger. Em. 850. V. purpurea; Matth. Valgr. v. 2. 522. Camer. Epit. 910.)—Scyons creeping. Leaves heart-ſhaped, crenate, ſmoothiſh as well as the footſtalks. Calyx obtuſe. Two lateral petals with a hairy line.—Native of thickets, groves, and banks, throughout Europe, from Sweden to Greece, flowering in March. It appears, by Dr. Muhlenberg's catalogue, to be cultivated, not wild, in North America. There can be no doubt of this being the ἴον πορφυροῦν of Dioſcorides, who ſpeaks of the ivy-like *leaves*, and very ſweet-ſcented purple *flowers*, which he recommends for ſore throats, and for children in the falling-ſickneſs; hence ſyrup of violets is ſtill kept in the ſhops. The long trailing leafy *runners*, by which the plant is widely increaſed, characterize this ſpecies. Theſe ſeldom bear *flowers* till the ſecond year. *Leaves* truly heart-ſhaped, dark green; ſlightly downy beneath. *Stipulas* lanceolate, toothed, pale. *Flower-ſtalks* taller than the leaves, with two lanceolate narrow *bracteas*, more than half way up. *Flower* nodding, twice the ſize of *V. paluſtris*, and about equal to that of *hirta*, whoſe ſcent reſembles Orrice-root, or the flowers of Mignonette, or the Vine, and indeed is too generally known and eſteemed to require deſcription. The colour is that dark purpliſh-blue, peculiarly called a *violet colour*. There is a white variety, frequently found wild; and a very double one cultivated in gardens, which requires a pure air. Whether the more early pale grey, and very ſweet double Violet, be a variety, or a diſtinct ſpecies, we have had no opportunity of enquiring. The *ſtamens* of *V. odorata* are quite diſtinct. *Capſule* ſoft, pale green, minutely dotted with red, like an unripe Cranberry. Leers, in his Fl. Herborn. 189, mentions having once found a curious flower of this ſpecies which had five regular *petals*, all ſpurred, reſembling the nectaries of an *Aquilegia*, ſtripped of its own petals. This was, as he ſays, an inſtance of PELORIA in *Viola*; ſee that article. The *petals* are often wanting in our wild, as well as garden, Violets.

25. V. *pyrenaica*. Pyrenean Violet. "Decand. Franc. v. 4. 803." Poiret in Lam. n. 19.—Leaves ſlightly heart-ſhaped, crenate, ſmooth. Footſtalks dilated at the ſummit. Calyx obtuſe. Spur very ſhort.—Found by M. Ramond, on the Pyrenees, in ſtony ground. Perennial. This is ſaid to differ from *V. odorata* in having more woody *roots*, without runners. *Stipulas* greener, and narrower. *Leaves* ſcarcely heart-ſhaped. *Nectary* ſhorter, ſtraighter and more obtuſe. *Flowers* ſmaller, leſs fragrant, the lip more ſtrongly radiated. *Decandolle* and *Poiret*.

Sect. 2. *With leafy ſtems*.

26. V. *canina*. Dog's Violet. Linn. Sp. Pl. 1324. Willd. n. 13. Fl. Brit. n. 4. Engl. Bot. t. 620. Curt. Lond. faſc. 2. t. 61. (V. canina ſylveſtris; Ger. Em. 851. V. canina cærulea inodora ſylveſtris ſerotina; Lob. Ic. v. 1. 609. V. inodora major; Rivin. Pentap. Irr. t. 119.)—Stem at length aſcending, channelled. Leaves oblong-heartſhaped. Calyx acute. Stipulas ſerrated.—Even more common throughout Europe than the Sweet Violet, being as abundant in Greece, and its neighbouring iſlands and mountains, as it is in England or Sweden, flowering from April throughout moſt part of the ſummer, when every thicket, grove, bank, and barren heath abounds with its pale purple ſcentleſs bloſſoms. The *root* is woody, though ſlender. The firſt *flowers* are radical; but ſeveral branched, angular or furrowed, ſmooth, leafy *ſtems* ſoon ſpring forth, extremely variable in length, direction, and luxuriance, which continue growing, and bearing numerous, axillary, ſtalked *flowers*, for ſeveral weeks. The *leaves* vary no leſs in ſize, and ſomewhat in figure, but are always crenate, ſmooth, heart-ſhaped; more or leſs oblong. *Footſtalks* ſlightly dilated upwards. *Stipulas* not very deeply toothed. *Bracteas* above the middle of the *flower-ſtalks*. *Capſule* more oblong than in the *V. odorata*. See a ſpecies nearly related perhaps to this at n. 63.

Several varieties are mentioned by authors. That with a white *flower* is leſs frequent than in *V. odorata*. Can this be *V. neglecta* of the Fl. Taur.-Caucaſ. v. 1. 172? The γ of Fl. Brit., found by M. Du Bois about Mitcham, is ſmaller in all its parts, and ſaid by Dillenius to have a yellowiſh, not a whitiſh ſpur, a very trifling difference indeed! We have in Norfolk a diminutive, though truly ſhrubby plant, firſt noticed by the late Mr. Crowe, in which we cannot diſcern any ſpecific difference from *V. canina*, except ſize, and perhaps a thicker texture of leaf. Yet it has remained unchanged in a garden, where the ſoil is manured, for above twelve years. This cannot be the δ of Fl. Brit. (V. alpina; Hudſ. ed. 1. 379. V. martia alpina, folio tenello circinato; Raii Syn. 366.) The *leaves* are exactly heart-ſhaped, obtuſe, ſmooth, coriaceous, minutely crenate. *Flowers* like *canina*, but not half ſo large. *V. ſarmentoſa*, Fl. Taur.-Caucaſ. v. 1. 172, we have not ſeen, and therefore muſt leave it in doubt.

27. V. *lactea*. Cream-coloured Violet. Fl. Brit. n. 5. Engl. Bot. t. 445. Ait. n. 15. (V. canina, var. 3; With. 262. V. Ruppii; Allion. Ped. v. 2. 99. t. 26. f. 6. V. flore albo; Rivin. Pentap. Irr. t. 120.)—Stem aſcending, round. Leaves ovato-lanceolate. Stipulas deeply ſerrated.—Native of moiſt rather mountainous heaths, in the ſouth of England. Mr. T. F. Forſter found it firſt on the wolds at Tunbridge; Mr. Stackhouſe at Pendarvis, Cornwall. M. Reynier gathered ſpecimens, now before us, in the bogs of Switzerland, but rarely, and he has indicated Rivinus's figure, which, though taller and larger, reſembles our plant. Nevertheleſs we much doubt the permanency of the ſpecies, and were only led by the great authority, in this genus, of our friend Mr. Forſter, to adopt it. The whole plant is ſmaller than the ordinary *canina*, but the chief difference conſiſts in the *leaves* being lanceolate or ovate, decurrent at the baſe, not heart-ſhaped. The *ſtipulas* are ſuppoſed to be more deeply cut, and *bracteas* broader. The *petals* are narrower than in *canina*, obtuſe, whitiſh, ſtreaked with purple lines exactly like *canina*. They even vary often to a light blue.

28. V. *montana*. Long-leaved Mountain Violet. Linn. Sp. Pl. 1325. Willd. n. 14. Ait. n. 16. (V. flore cæruleo longifolia; Rivin. Pentap. Irr. t. 121. V. aſſurgens tricolor; Ger. Em. 854. V. arboreſcens; Camer. Epit. 911. Matth. Valgr. v. 2. 523, bad. V. erecta, flore cæruleo et albo; Moriſ. ſect. 5. t. 7. f. 7.)—Stems erect. Leaves ovate-oblong, ſomewhat heart-ſhaped. Stipulas pinnatifid at one ſide.—Native of the mountains of Lapland, Germany, Switzerland, and the north of Italy; a hardy perennial in our gardens, flowering in May and June. The name of *arboreſcens*, given firſt by Matthiolus, has been juſtly thought abſurd. The numerous *ſtems* are herbaceous and

and annual, twelve or eighteen inches high, erect, straight, smooth, leafy, but little branched. *Leaves* two inches and a half long, and one broad, bluntly serrated, smooth. *Footstalks* an inch long. *Stipulas* for the most part longer than the footstalks, lanceolate, obtuse; half-ovate at the base, and more or less pinnatifid at the outer, more rounded, margin. *Flower-stalks* axillary, shorter than the leaves, each with two awl-shaped *bracteas* above the middle, and a large, greyish-blue, inodorous *flower*. *Calyx-leaves* acute, unequal in breadth; much elongated and toothed at the base. *Capsule* oblong, triangular. *Seeds* oval.

29. V. *concolor*. Green-flowered Violet. Forster Tr. of Linn. Soc. v. 6. 309. t. 28. Ait. n. 24. Pursh n. 21. Muhlenb. Cat. 26.—Stem erect, downy. Leaves elliptic-lanceolate, tapering at each end. Stipulas linear-lanceolate, entire.—Native of lime-stone rocks in Pennsylvania, flowering in June and July. *Pursh*. Mr. Forster received living plants from America before the year 1788. The *root* is fibrous, perennial. *Stems* simple, erect, leafy, from one to two feet high, angular and furrowed, most hairy in the upper part. *Leaves* three inches long, more or less, and above one broad, entire or somewhat toothed, taper-pointed, ciliated, running down into shortish bordered *footstalks*. *Stipulas* four, two smaller than the rest. *Flowers* very small, green, on axillary stalks, two together, one of them imperfect. The *flowers* are very rarely produced in a garden. Their diminutive size, and green *petals*, are very peculiar, as is indeed the whole habit of this curious species; yet we see no possible reason for separating it from *Viola*. The *capsule*, figured, but not described, by Mr. Forster, appears rather large in proportion to the flower, elliptical, acute, with large, oval, not numerous, *seeds*.

30. V. *canadensis*. Canadian Violet. Linn. Sp. Pl. 1326. Willd. n. 17. Ait. n. 18. Pursh n. 14.—Stem nearly erect, partially hairy, almost round. Leaves heart-shaped, pointed, serrated, smooth. Stipulas slightly notched. Capsule downy.—In shady woods, in rich moist situations, on the mountains, from Canada to Carolina; perennial, flowering from June to August. *Flowers* sweet-scented; on the outside purplish-blue; on the inside white, elegantly veined. *Pursh*. The habit of the plant is somewhat akin to *V. canina*. *Stem* a span high, simple, most leafy in the upper part; often marked partially, more or less distinctly, with a downy lateral line. *Leaves* stalked, broad at the base, somewhat deltoid, with about seven ribs; their length an inch and a half; breadth nearly as much. *Stipulas* ovato-lanceolate, rarely notched. *Flower-stalks* about equal to the *leaves*, angular, with one or two minute *bracteas* towards the bottom. *Calyx-leaves* linear-lanceolate, smooth; heart-shaped, very little elongated, at the base. *Corolla* often white on both sides. *Capsule* globular, densely villous, especially in an early state; which we do not find noticed, but it appears to distinguish the species very satisfactorily.

31. V. *striata*. Streaked Violet. Ait. n. 19. Willd. n. 18. Pursh n. 15.—Stem nearly erect, semi-cylindrical. Leaves heart-shaped, pointed, smooth, serrated. Stipulas with fringe-like serratures. Capsule smooth.—In shady woods, from Pennsylvania to Virginia; perennial, flowering from May to July. *Flowers* white, with purple veins. *Pursh*. This resembles the last, but the *stipulas*, and if we mistake not, the smoothness of the *capsule*, afford a clear specific distinction between it and the last. The *flower-stalks* bear a pair of very narrow awl-shaped *bracteas* towards the top. The *calyx* is considerably elongated at the base.

32. V. *debilis*. Weak-stalked Violet. Michaux Boreal.-Amer. v. 2. 150. Pursh n. 16.—Stem ascending. Leaves kidney-heartshaped, scarcely pointed, smooth, crenate. Stipulas with fringe-like serratures. Flower-stalks twice the length of the leaves.—In low grounds, from Pennsylvania to Carolina; perennial, flowering from May to July. About half the size of the two preceding, with light-blue *flowers*. *Bracteas* linear, on the upper part of the *stalks*. *Calyx* decidedly elongated at the base. *Capsule* quite smooth. Most akin to *V. striata*, but apparently distinct.

33. V. *rostrata*. Larkspur Violet. Pursh n. 17.—Stem ascending. Leaves roundish-heartshaped, serrated, smooth. Stipulas deeply fringed. Flower-stalks twice the length of the leaves. Nectary longer than the petals.—On shady rocks, near Easttown, Pennsylvania; perennial, flowering in May and June. *Flowers* blue. *Pursh*. About the stature of the last. The *leaves* have a small blunt point. *Stipulas* often rather pinnatifid than fringed, almost as long as the *footstalks*. *Bracteas* awl-shaped, above half way up the *stalks*. *Flowers* large, very much like *Delphinium Consolida* in size, colour, and general aspect. *Nectary* an inch long, obtuse, slightly recurved.

34. V. *pubescens*. Downy Yellow Violet. Ait. n. 20. Willd. n. 19. Pursh n. 18. (V. pensylvanica; Michaux Boreal.-Amer. v. 2. 149.)—Stem erect, simple, downy, leafy at the top. Leaves triangular-heartshaped; most downy beneath. Stipulas ovate, notched at the extremity.—In shady woods among rocks, particularly lime-stone, from New York to Virginia; perennial, flowering in May and June. *Pursh*. Sent to Kew garden in 1772, by Mr. W. Young. We are indebted to Mr. Francis Boott, a young botanist of great zeal and intelligence, for finer specimens of this, and many other North American plants, than have ever before been seen in Europe. The *root* has many long, stout, simple fibres. *Herb* rather succulent, more or less clothed with fine short silky pubescence. *Stem* simple; naked in the lower part; with three or four *leaves* at the top, which are two inches wide, serrated, bright green, many-ribbed. *Stipulas* shorter than the lowest *footstalk*, longer than the others. *Flower-stalks* downy, rather shorter than the leaves, destitute, as far as we can discern, of *bracteas*. *Flowers* nearly as large as *V. canina*, yellow, with brown veins. *Calyx* scarcely elongated at the base.

35. V. *hastata*. Halberd-leaved Yellow Violet. Michaux Boreal.-Amer. v. 2. 149. Pursh n. 19. Ait. Epit. 376.—Stem erect, simple, leafy at the top, smooth as well as the hastate, nearly sessile, leaves. Stipulas minute, finely toothed.—On high mountains, from Pennsylvania to Carolina; perennial, flowering in May and June. *Flowers* yellow. *Pursh*. Introduced at Kew, we presume by Mr. Masson, in 1803. This seems nearly related to the last, and indeed to the following, though all are sufficiently well discriminated. We have not seen specimens of this or the *V. Nuttallii*. It is much to be wished that such as are not yet figured, might find a place in some periodical work.

36. V. *Nuttallii*. Yellow Missouri Violet. Pursh n. 20.—"Downy. Stem simple, erect. Leaves ovate-oblong, acute, ribbed, slightly toothed; tapering down into long footstalks. Stipulas lanceolate, undivided. Flower-stalks the length of the leaves."—Found by Mr. Nuttall, on the banks of the Missouri; perennial, flowering in June. *Flowers* yellow. *Pursh*.

37. V. *mirabilis*. Broad-leaved Violet. Linn. Sp. Pl. 1326. Willd. n. 20. Ait. n. 21. Jacq. Austr. t. 19. Fl. Dan. t. 1045. (V. montana latifolia, flores ex radice, semina in cacumine ferens; Dill. Elth. 408. t. 303.)—Stem erect, triangular, leafless in the middle. Leaves kidney-heartshaped, acute, crenate, smooth. Upper flowers without petals. Calyx much dilated at the base. Stipulas lanceolate, entire.—Native of woods and bushy places in Sweden

den and Germany. A hardy perennial, flowering in July and August. The *ftems* are a foot high, leafy at the bottom and top only, fmooth. *Leaves* two or three inches broad, acute; the radical, or lower, on very long ftalks; the upper on very fhort ones. Radical *flowers* the fize of *V. odorata*, light reddifh-purple, with a veiny lip: axillary ones about the top of the ftem, on fhorter *ftalks*, generally without *petals*, but alone, for the moft part, perfecting *feed*. The bafe of the *calyx-leaves* in all is much dilated, abrupt, one-third as long as the reft of the calyx. *Capfule* large, rigid, veiny, fmooth. The fpecific name alludes to the *fruit* being produced by apparently imperfect *flowers*, not, as De Theis imagined, to their great fize or admirable beauty. Such a circumftance in the fructification of Violets occurs in feveral other fpecies.

38. V. *biflora*. Two-flowered Yellow Violet. Linn. Sp. Pl. 1326. Willd. n. 21. Ait. n. 22. Fl. Dan. t. 46. (V. flore luteo; Rivin. Pentap. Irr. t. 121. V. montana prima; Cluf. Hift. v. 1. 309. V. alpina rotundifolia minor; Pluk. Phyt. t. 233. f. 7.)—Stem erect, about two-flowered. Leaves kidney-fhaped, ferrated, nearly fmooth. Stipulas ovate, entire.—Native of the mountains of Lapland, Auftria, Switzerland, and Savoy, but not of Britain. Sometimes kept, with other alpine plants, in pots, under a frame, in our gardens, flowering in the fpring. This is a pretty delicate fpecies, three or four inches high, allied to feveral of the preceding, but perfectly diftinct. The flender fimple *ftem* bears three or four ftalked *leaves*, an inch or inch and half in diameter; and ufually two diftant, axillary, flender-ftalked, fmall, yellow *flowers*, whofe lip is ftreaked with black. *Bracteas* minute, about the middle of each ftalk. *Calyx-leaves* fcarcely dilated or elongated, but rather gibbous, at the bafe. *Capfule* fmooth, rigid. *Seeds* few, large.

39. V. *uniflora*. Siberian Yellow Violet. Linn. Sp. Pl. 1327. Willd. n. 22. Ait. n. 23. (V. n. 67; Gmel. Sib. v. 4. 101. t. 48. f. 5.)—Stem fingle-flowered, leafy at the top only. Leaves heart-fhaped, toothed.—Native of Siberia. Said to have been cultivated in 1774, by the late Mr. James Gordon; but we prefume it would be as eafy to find one of the artificial golden flowers of the ancient Mexicans in our gardens at prefent, for its name does not even appear in Mr. Donn's Cambridge catalogue. The *root* of this rare and very curious fpecies is thread-fhaped, toothed, perennial, with long fimple fibres. *Herb* about the fize and habit of the Winter Aconite, *Helleborus hyemalis*, but rather downy, efpecially the *ftem*. *Leaves* two or three, crowded at the fummit of the ftem, on very fhort ftalks, ovate or heart-fhaped, an inch long, fcarcely downy, coarfely toothed, with a blunt point; their bafe entire. *Stipulas* fmall, lanceolate, with glandular teeth. *Flowers* yellow, larger than any of the preceding; their *petals* rounded, an inch long; two lateral ones bearded at the bafe. *Calyx-leaves* oblong, fomewhat heart-fhaped at their infertion, but hardly dilated or elongated. Gmelin's figure is very incorrect.

40. V. *decumbens*. Narrow-leaved Cape Violet. Linn. Suppl. 397. Willd. n. 23. Thunb. Prodr. 41.—Stems procumbent, round. Leaves linear, crowded, acute, entire. Calyx fmooth. Petals of nearly equal length.—Native of the Cape of Good Hope. *Stems* fmooth, fomewhat branched, rather fhrubby, a fpan long. *Leaves* numeroufly crowded about the ends of the branches, alternate, an inch and half long, hardly a line broad; tapering at the bafe, where they are united to a pair of minute lanceolate *ftipulas*. *Flower-ftalks* axillary, folitary on each branch, and rifing above its fummit, twice the length of the leaves, flender, with two awl-fhaped *bracteas* about the middle. *Flower* blue, far more like *V. canina* than *tricolor*, to which Linnæus compares it; but the *calyx-leaves* are very flightly extended at the bafe. *Nectary* pale green.

41. V. *arborefcens*. Shrubby Dwarf Violet. Linn. Sp. Pl. 1325. Willd. n. 30. Ait. n. 30. (V. hifpanica fruticans; Barrel. Ic. t. 568.)—Stem afcending, fhrubby, branched. Leaves lanceolate, downy, entire. Calyx minutely fringed. Petals of nearly equal length.—Native of the fouth of Spain, about Conil and Tariffa, flowering in February. *Durand*. A greenhoufe plant, cultivated by the late Mr. Blackburne, in his rich garden at Orford, Lancafhire, in 1779, as appears by his Catalogue; but fcarcely now, probably, exifting in any collection. The *root* is long and woody, as are alfo the *ftems*, whofe extremities terminate in many denfe, crowded, leafy *branches*. *Leaves* refembling thofe of a *Cheiranthus*, more or lefs hoary, an inch long, tapering down into flender *footftalks*, each accompanied by two longifh very narrow *ftipulas*. *Flowers* fomewhat like the laft, but the *nectary* is very fhort, and *calyx-leaves* more elongated at the bafe, each marked with three ribs. Poffibly *V. cheiranthifolia*, Poiret in Lam. n. 43, may not be diftinct from this.

42. V. *capenfis*. Hoary Cape Violet. Thunb. Prodr. 40. Willd. n. 29.—Stem fhrubby, erect, downy. Leaves obovate, crenate, hoary. Calyx-leaves ovate, hairy. Lower petal abrupt, thrice as long as the reft.—Gathered at the Cape of Good Hope by Thunberg, from whom we have an unnamed native fpecimen, which can belong to no other fpecies. It is more or lefs downy in every part, efpecially the *flower-ftalks*, and *calyx*, which is not at all extended at the bafe. *Leaves* alternate, ftalked, an inch long. *Stipulas* extremely minute, lanceolate. This is one of thofe fpecies of which the lower *petal*, or *lip*, is fo much extended, or rather the other four petals fo diminifhed, as to have a very peculiar afpect; added to which, the bafe of the *calyx* is quite fimple, not protracted beyond the infertion. Such fpecies have given occafion to the late M. Ventenat to eftablifh his genus *Ionidium*, in Jard. de la Malmaif. t. 27, of which the diftinctive characters are, the want of a fpur to the *corolla*, and of appendages, or elongations, to the *calyx-leaves*. Thefe characters fhould feem to indicate a diftinct genus from *Viola*; but there are fo many gradations, fome of which we have noted in their proper places, with refpect to the *calyx*, and no lefs with regard to the *nectary*, that we cannot rely on either part; efpecially as the habit does not always concur with thefe differences. Several of the fuppofed fpecies of *Ionidium* have as evident a fpur, though fhort, as any *Viola*. Their *calyx*, it muft be allowed, is more conftant, but feveral undoubted *Viola* have as little of a projection there. Ventenat was, moreover, but imperfectly converfant with the fpecies of his fuppofed genus, as will appear in the courfe of our hiftory of them.

43. V. *buxifolia*. Box-leaved Madagafcar Violet. Poiret in Lam. n. 56. (Ionidium buxifolium; Venten. Malmaif. under t. 27.)—Stems afcending, fmooth, herbaceous. Leaves obovate, fmooth, revolute, entire. Calyx-leaves ovate, naked. Lower petal abrupt, twice as long as the reft.—Gathered by Commerfon in Madagafcar. *Thouin*. Allied very nearly to the laft, but fmooth, and lefs fhrubby. The *leaves* are rather fmaller, and greatly refemble Box, or rather *Polygala Chamæbuxus*. The *root* is woody. *Stems* fix inches long, fpreading every way, leafy, fcarcely branched. *Stipulas* minute, awl-fhaped. *Flower-ftalks* twice the length of the leaves, with two fmall awl-fhaped *bracteas* towards the top. *Calyx-leaves* broad at the bafe, efpecially the two lowermoft, which have membranous edges, and embrace the rounded

rounded ſpur of the *nectary*, which is extended a little beyond them. Here a material character of *Ionidium* fails us. Lateral *petals* veined, half as long as the ſpatulate lip. *Capſule* ovate, ſmooth. *Seeds* four in each cell, pale, oval, abrupt, beautifully ſtriated longitudinally.

44. V. *enneaſperma*. Nine-ſeeded Violet. Linn. Sp. Pl. 1327. Willd. n. 33, excluding the ſynonym of Burmann. (Ionidium enneaſpermum; Venten. Malmaiſ. under t. 27. I. heterophyllum; ibid. according to the characters and ſynonym. Viola furrecta maderaſpatenſis, lini facie, rotundioribus imis foliis; Pluk. Phyt. t. 120. f. 8. "Nelamparenda; Rheede Hort. Malab. v. 9. 117. t. 60.")—Stem erect, much branched from the bottom. Leaves lanceolate or linear, ſomewhat revolute, ſmoothiſh, ſlightly toothed. Calyx-leaves lanceolate, naked. Lower petal twice as long as the reſt.—Native of Ceylon, Tranquebar, and Madagaſcar. The *root* is long, ſimple, woody, perennial. *Stems* ſeveral, branched chiefly in the lower part, erect, ſix inches high, angular, ſmooth. *Leaves* rather glaucous, various in length and breadth, ſtalked; the lower ones ſhorteſt and roundeſt; none more than an inch, or an inch and half, long. *Stipulas* minute, awl-ſhaped, ſpreading, like little prickles. *Flower-ſtalks* ſhorter than the leaves. *Flowers* purpliſh, very like the laſt; but the *calyx-leaves* are much narrower and more acute; *lip* obovate, not ſo abrupt. *Seeds* only three in each cell, ſtriated in the ſame manner, but rather larger. Such is the plant of the Linnæan herbarium, which muſt be n. 317 of Linn. Fl. Zeyl. 149, though its *leaves* are certainly not quite entire, nor in any ſenſe linear; neither are the *ſtipulas* wanting. Ventenat rightly finds fault with Willdenow for citing a plant of Burmann's Fl. Zeyl. t. 85, which he alſo cites, more correctly, for *Polygala theezans;* but the error is Linnæus's, and Willdenow copies him without examination. *V. linifolia*, Poir. in Lam. n. 61, from Madagaſcar, has perfectly linear, very narrow, *leaves*, but is certainly a mere variety.

45. V. *ſuffruticoſa*. Madder-leaved Violet. Linn. Sp. Pl. 1327. Fl. Zeyl. n. 318. 150. Willd. n. 34. (Rubeola zeylanica, foliis latioribus, *ratmul* dicta; Burm. Zeyl. 208.)—"Stem procumbent. Leaves lanceolate, crowded, ſomewhat ſerrated. Calyx even at the baſe."—Native of Ceylon. *Herb* procumbent, much branched, hard, like *Ciſtus Helianthemum*. *Leaves* acute, ſcarce evidently ſerrated, tapering down into *footſtalks*. *Stipulas* awl-ſhaped, hardiſh, permanent; hence the plant becomes rough, and in a manner prickly. *Flowers* as in the laſt. *Linn. in Fl. Zeyl.*

We have ſeen no ſpecimen of this. However the *ſtipulas* may be, the procumbent *ſtem* ſeems the moſt ſtriking difference between theſe two ſpecies.

46. V. *verticillata*. Whorl-leaved Violet. "Ortega Decad. 4. 50." Ait. n. 25. (Ionidium polygalæfolium; Venten. Malmaiſ. t. 27.)—Stems procumbent. Leaves oppoſite, lanceolate, entire, with lanceolate ſtipulas, one-third of their length. Flower-ſtalks drooping, as long as the leaves. Corolla without a ſpur, nearly equal.—Native of South America. A greenhouſe perennial herbaceous plant, brought from Spain, in 1797, by the late marchioneſs of Bute. The inconſpicuous reddiſh *flowers* are produced during ſummer. This is related to ſeveral of the laſt-deſcribed, inaſmuch as the *calyx* is not extended at the baſe; but the *corolla* is alſo nearly, or quite, deſtitute of a ſpur, without any great diſproportion between the ſeveral *petals*. The oppoſite *leaves* are almoſt unparalleled in this genus. They are erroneouſly called whorled, though the large *ſtipulas*, reſembling leaves, give that appearance. The *ſeeds* are ſmooth, black, two in each cell.

47. V. *ſtricta*. Stiff Oppoſite-leaved Violet. Poiret in Lam. n. 66. (Ionidium ſtrictum; Venten. Malmaiſ. under t. 27.)—"Leaves oppoſite, lanceolate, entire. Stipulas very ſhort. Flower-ſtalks erect, ſhorter than the leaves."—Found in Hiſpaniola by M. Poiteau. *Ventenat*. *Stems* above a foot high. *Leaves* an inch long. *Flowers* whitiſh, with narrow obtuſe *petals*. *Poiret*. It is ſaid to be related to Poiret's *V. linariæfolia*, a ſpecies concerning which we have not ſufficient information.

48. V. *labioſa*. Large-lipped Violet.—Stem erect. Leaves oppoſite, linear, revolute, ſmooth. Stipulas minute. Flowers racemoſe. Lower petal obovate, very large, with a ſhort ſpur.—Sent by Dr. White from New South Wales, among the firſt ſpecimens collected in that country. This very remarkable ſpecies is evidently akin to *V. enneaſperma* and *verticillata*, with their allies, but nevertheleſs ſo diſtinct in many important characters, that we are at a loſs which to ſelect for diſcrimination. The *ſtems* are from nine to twelve inches high, angular, erect, rigid, ſmooth like the reſt of the herbage. *Leaves* an inch and half or two inches long, very narrow, acute, entire; tapering at the baſe, ſeſſile; ſome of the lower ones ſcattered, but the greater part oppoſite. *Stipulas* hardly diſcernible. *Flowering branches* like the reſt of the ſtem in thickneſs, but deſtitute of leaves, bearing ſeveral rather diſtant *flowers*, on ſhort, drooping, *partial ſtalks*, ſo as to conſtitute a true *cluſter*. *Calyx* very ſmall; its leaves lanceolate, acute; the two lower ones gibbous at the baſe, claſping the ſpur. Four of the *petals* ovate, pointed, very little longer than the calyx, pale, with dark veins; the two lateral ones much dilated and rounded at the lower ſide; the fifth petal, or *lip*, is diſproportionately large, an inch long, broadly obovate, abrupt or emarginate, veiny, apparently roſe-coloured; its claw channelled, the length of the other petals, ending behind in a rounded ſpur, extending beyond the baſe of the calyx. *Capſule* ovate, ſmooth. *Seeds* two in each cell, large, orbicular, black and ſmooth, as in *V. verticillata;* not furrowed, as in *enneaſperma* and *buxifolia*.

49. V. *theſiifolia*. Toad-flax-leaved Violet. Poiret in Lam. n. 69.—Leaves alternate, linear, entire, ſmooth, very long. Stipulas awl-ſhaped. Flowers axillary, nearly ſeſſile.—Gathered by Adanſon, in Senegal. *Roots* ſlender. *Stem* erect, herbaceous, ſcarcely branched, cylindrical, or a little compreſſed, ſmooth. *Leaves* two or three inches, or more, in length, a line or two broad. *Stipulas* very acute. *Flowers* very ſmall. *Calyx-leaves* narrow, acute. *Petals* whitiſh, hardly longer than the calyx. *Capſule* roundiſh-oval, obtuſe. *Poiret*.

50. V. *longifolia*. Long-leaved Cayenne Violet. Poiret in Lam. n. 68.—Stem ſhrubby. Leaves lanceolate, ſerrated, very ſmooth. Flowers ſolitary or aggregate, on capillary ſtalks, hardly ſo long as the awl-ſhaped nectary.—Native of Cayenne. Preſerved in the herbarium of profeſſor Desfontaines. Remarkable for the great ſize of its *leaves*, which are four or five inches long, finely ſerrated, and the ſmallneſs of its *flowers*, which grow on capillary axillary *ſtalks*, ſix lines at moſt in length, either ſolitary, or ſeveral together. The *calyx* is ſmooth, minute. *Petals* whitiſh, with a ſtraight awl-ſhaped *ſpur*, at leaſt as long as the ſtalk.

We preſume, from Poiret's authority, that this laſt ſpecies has no poſterior elongation of the *calyx*, though the *ſpur* is ſo conſiderable. It may therefore, conſidering the *leaves*, ſerve to connect the foregoing ſpecies with the following.

51. V. *glutinoſa*. Clammy Violet. Poiret in Lam. n. 63. (Ionidium glutinoſum; Venten. Malmaiſ. under t. 27.)

t. 27.)—Stem branched. Leaves ovate, ferrated, fmooth; tapering at the bafe; the lower ones oppofite. Stipulas lanceolate, acute. Flower-ftalks the length of the leaves. Lip twice the length of the calyx, without a fpur.—Gathered by Commerfon, on rocks at Monte-Video. The ftem is perhaps fhrubby, apparently two feet at leaft in height, our fpecimen having feveral oppofite, angular, leafy *branches*, each a foot long, fomewhat downy. Both the *ftem* and *leaves* are faid to be covered with a glutinous moifture. The upper *leaves* are chiefly alternate, an inch long, ftalked, veiny. *Flowers* numerous, axillary, folitary, not bigger than a large pin's head, drooping, whitifh, without *bracteas*. *Calyx-leaves* ovate, acute, combined at the bafe, a little gibbous, but not elongated, in that part. Four of the *petals* rather longer than the calyx: *lip* twice as long, abrupt, with no protruding fpur. *Capfule* globofe. The form and proportion of the *petals* appear fimilar to *V. verticillata*, n. 46.

52. V. *parviflora*. Small-flowered South American Violet. Linn. Suppl. 396. Willd. n. 32. Poiret in Lam. n. 60. Cavan. Ic. v. 6. 21.—Stem branched, diffufe, downy. Leaves ovate, ferrated, fmooth; obtufe at the bafe. Stipulas awl-fhaped. Flower-ftalks the length of the leaves. Lip twice the length of the calyx, without a fpur.—Native of Mexico. The *root* is woody. *Stems* feveral, fhrubby, branched, leafy, a foot or more in length. *Leaves* about half as long as the laft, but of a broader, more ovate, form, not at all tapering at the bafe; their ferratures few and large. The lower ones are fometimes oppofite. The *flowers* are fo much like the preceding, that we can fcarcely find any difference. Their *ftalks*, about half an inch long, remain after the *capfules* are fallen off. The *lip* has perhaps a flight rounded protuberance at its bafe, but not extending beyond the *calyx*.

53. V. *oppofitifolia*. Lanceolate Oppofite-leaved Violet. Linn. Sp. Pl. 1327. Willd. n. 36. (Calceolaria, n. 1; Lœfl. It. 183.)—Stem fhrubby, crofs-branched, fmooth. Leaves oppofite, lanceolate, nearly feffile, acutely ferrated. Flowers racemofe.—Gathered by Lœfling, in South America. Many circumftances, indicated by that author, fhew an affinity between this and ten or eleven of the foregoing fpecies, efpecially perhaps the two laft. They all, in fome particular or other, form exceptions to the characters or habit of a *Viola*. The *ftems* of that before us are defcribed as erect, from a fpan to eighteen inches high, woody below, round, fmooth, with oppofite *branches*. *Leaves* on very fhort ftalks; their ferratures long, not deep; the extremity entire. *Flowers* white, in folitary fpreading *clufters* (fee n. 48.), their ftalks partly permanent. *Calyx* gibbous below. *Lip* fcarcely fo broad as its claw, bent upwards, and revolute, at the end. *Capfule* triangular. *Seeds* fomewhat angular. This plant has fomething of the habit of *Veronica Anagallis*, or *V. fcutellata*. *Lœfling*.

54. V. *Calceolaria*. Shaggy Slipper Violet. Linn. Sp. Pl. 1327. Willd. n. 35. (V. Itoubou; Aubl. Guian. 808. t. 318. Calceolaria, n. 2; Lœfl. It. 184.)—Stems hairy, herbaceous. Leaves fcattered, nearly feffile, ovate, ferrated, very hairy as well as the lanceolate ftipulas and bracteas. Calyx fhaggy with branched hairs. Lip kidney-fhaped.—Native of South America. Gathered by Aublet in Cayenne and Guiana, in fandy ground, flowering at various feafons. This is diftinguifhed by the copious, filky, fhaggy hairs, covering every part of the herbage. The *ftems* are a foot high, fimple or branched, leafy. *Leaves* an inch long. *Flowers* folitary, ftalked, white or blue. Four *petals* fmall, convoluted. *Lip* very large, briftly underneath. *Capfule* hairy. *Seeds* oval, fmooth.

55. V. *Ipecacuanha*. Ipecacuanha Violet. Linn. Mant. 484. Suppl. 397. (V. grandiflora, veronicæ folio villofo, Ipecacuanha alba dicta; Barrere Fr. equinox. 113. Pombalia Ipecacuanha; Vandelli Fafc. 7. t. 1.)—Stem fhrubby, erect. Leaves fcattered, ovate, crenate; hairy underneath and at the margin. Calyx hairy. Lip very abrupt, twice as broad as long.—Native of Brafil. Cultivated by Vandelli at Lifbon, where it flowered in October, in the greenhoufe. The *root* is white, woody, with many cylindrical branches, and is reported to poffefs the qualities of the true IPECACUANHA (fee that article); though in a weaker degree. The *ftem* is two feet high. *Leaves* ftalked, an inch or inch and half long. *Flowers* fragrant, pale red, with a very fhort but broad lip, near an inch wide, involute at each fide. *Seeds* roundifh, five or fix in each cell.

56. V. *diandra*. Diandrous Climbing Violet. Linn. Syft. Veg. ed. 13. 669. Willd. n. 39.—Stem herbaceous, trailing. Leaves oblong, remote. Stalks fingle-flowered. Nectary very long and twifted. Three of the ftamens abortive.—Native of Guiana. *Stem* thread-fhaped, climbing up hedges. *Leaves* alternate. *Flower-ftalks* axillary, folitary, with a joint; fwelling upwards. *Bracteas* two, minute. *Calyx* not at all prominent behind. *Corolla* white. *Lip* uppermoft, very large, with a long twifted fpur. *Lateral petals* afcending; two *lower ones* fmaller, deflexed. Two hinder *ftamens* only perfect. *Allamand*.

57. V. *Hybanthus*. Gibbous Climbing Violet. Linn. Sp. Pl. 1328. Willd. n. 37, excluding Aublet's fynonym. (V. n. 209; Lœfl. It. 282? Hybanthus havanenfis; Jacq. Amer. 77. t. 175. f. 24, 25.)—Stem fhrubby, climbing, prickly. Leaves oblong, flightly ferrated, fmooth, aggregate. Flowers feveral on a ftalk. Lip fomewhat longer than the other petals, without a fpur.—Native of uncultivated hills about the Havannah. An elegant branching *fhrub*, feven feet high, erect. *Leaves* feveral from one bud, an inch and half long, emarginate; each tapering at the bafe into a fhort *footftalk*. *Flower-ftalks* one or two from the fame bud with the leaves, fhort, divided in the upper part, each bearing a few minute whitifh *flowers*, about the fize of *V. glutinofa* and *parviflora*, and nearly agreeing with thofe fpecies in ftructure, except that the *lip* appears fhorter in proportion. *Capfule* the fize of a pea. *Seeds* few, globofe. We take our defcription from Jacquin, having feen no fpecimen of his plant, or of Lœfling's; fo that we have no means of determining whether the *Viola* of the latter author, cited as above by Linnæus, be the plant in queftion, or whether Jacquin's conjectural reference to Lœfling's *Calceolaria frutefcens*, It. 184, be more correct. We are only certain that Aublet's *V. Hybanthus* is extremely different from the above; fee the following fpecies.

58. V. *laurifolia*. Laurel-leaved Climbing Violet. Linn. fil. MSS. (V. Hybanthus; Aubl. Guian. 811. t. 319; excluding Lœfling's fynonym.)—Stem fhrubby, climbing. Leaves ovate, pointed, very obfcurely crenate, fmooth, alternate. Flowers corymbofe. Nectary cylindrical, obtufe, thrice as long as the petals.—Found by Aublet, on the banks of waters in Guiana, flowering in April. The main *trunk* is three inches in diameter, and three or four feet high, fending forth long, round, twining *branches*, which climb the neighbouring trees. *Leaves* from four to fix inches long, veiny, very fmooth, entire, or flightly crenate towards the end, which Aublet's figure expreffes too ftrongly. *Footftalks* ftout, half an inch long, fmooth. *Flower-*

Flower-stalks axillary, long, corymbose, rarely simple and solitary, each bearing, about the middle, two minute opposite *bracteas*. *Flowers* pale yellow, sweet-scented, not unlike some species of *Impatiens*, the *nectary* being full an inch long. Two lateral *petals* much larger than the others. The structure of the parts of *fructification* answer well to *Viola*, so far at least as we can examine them. The *calyx-leaves* are, in some degree, gibbous, or extended at their base, though Aublet notices it not.

59. V. *stipularis*. Trailing Fringed Violet. Swartz Prodr. 117. Ind. Occ. 1956. Willd. n. 31. (V. persicariæfolia; Poiret in Lam. n. 39.)—Stem creeping, round, simple. Leaves ovate, crenate, smooth; tapering at each end. Stipulas fringed, longer than the footstalks. Flowers solitary, without a spur. Calyx dilated at the base.—Gathered by Mr. Francis Masson, on a lofty mountain called mount Misery, in the island of St. Kit's. *Stem* rather shrubby, trailing probably to the extent of several feet, smooth, taking root, and sending up short leafy *branches*, not above an inch long, from each joint. *Leaves* with their *footstalks* an inch and half or two inches long. *Stipulas* near an inch in length, crowded, ovato-lanceolate, taper-pointed, membranous, deeply fringed with fine, long, capillary teeth. *Flower-stalks* few, axillary, slender, shorter than the leaves, each with two awl-shaped *bracteas* above the middle. *Calyx-leaves* awl-shaped, long and slender, gibbous or dilated at the base, and apparently longer than the small blue *corolla*. No *spur* is discernible. Poiret has taken an inadmissible liberty, in changing the original name of this species, in compliance with an error of Cavanilles; see the following.

60. V. *setosa*. Upright Fringed Violet. (V. stipularis; Cavan. Ic. v. 6. 21. t. 531. f. 2. Poiret in Lam. n. 38.)—Stem erect, round, much branched. Leaves ovate, acute, serrated; unequal at the base. Stipulas fringed, longer than the footstalks. Flower-stalks solitary, twice the length of the leaves.—Native of the neighbourhood of Talcahuano, in Chili. The *stem* is shrubby, a foot high; we presume it, from the plate, to be erect, though nothing is said by the author upon that subject, nor whether the *leaves* be smooth, the *calyx* dilated at the base, or the *corolla* furnished with a spur. By the figure, the two latter characters seem wanting, and the *petals* are drawn obovate, the *lip* being broader, and rather longer, than the rest. The *stipulas* are fringed with long prominent bristles, much like the preceding. Cavanilles did not perceive that the specific name he chose had been long pre-engaged.

We shall here introduce some new species of this author, which, according to the incomplete information afforded by his work, seem naturally to follow what have just been described; though some essential particulars are neglected, especially the structure of the *calyx-leaves* at their base. If the figures be faithful, these are not at all dilated beyond their insertion. The figure and description of *V. philippica*, t. 529. f. 2, are such, that we dare not adopt that species at all.

61. V. *rubella*. Little Red Violet. Cavan. Ic. v. 6. 20. t. 531. f. 1. Poiret in Lam. n. 37.—Stem erect, shrubby. Leaves ovate, acute, serrated. Stipulas shorter than the footstalks, with bristly serratures. Flower-stalks solitary, shorter than the leaves. Spur half as long as the petals.—Native of Chili, flowering in February. This appears to be smooth, and the *stem* round. *Leaves* thrice the size of the last, obtuse and equal at the base, on *footstalks* an inch long. *Stipulas* scarcely half so long. *Flowers* reddish, much like the last in size and shape, except the *nectary*, which is obtuse, projecting beyond the base of the *calyx*.

62. V. *maculata*. Dotted-leaved Violet. Cavan. Ic. v. 6. 20. t. 530. (V. pyrolæfolia; Poiret in Lam. n. 32.)—Stem simple, erect. Leaves elliptical, crenate; acute at each end; dotted beneath. Stipulas pinnatifid. Flower-stalks longer than the leaves.—Native of the Falkland islands, flowering in December. This is certainly remarkable in its tribe for having yellow *flowers*. The dots on the *leaves* occur in some other species, even in *canina*, yet surely the name ought not to be arbitrarily changed. The *stem* is six inches high. *Leaves* an inch and half long; their *stalks* still longer. *Stipulas* hardly an inch in length, deeply and copiously pinnatifid. *Flower-stalks* axillary, rising much above the stem. *Flowers* drooping, the size of *V. odorata*, but yellow, their *spur* projecting beyond the base of the *calyx*, whose lanceolate taper-pointed leaves are represented a little gibbous at that side.

63. V. *adunca*. Hooked Violet.—Stems simple, ascending. Leaves ovate, somewhat heart-shaped, obtuse, crenate, downy, dotted. Stipulas loosely fringed. Flower-stalks longer than the leaves. Nectary hooked.—Brought by Mr. Menzies from the west coast of North America. This species has the size and habit of *V. canina*, and their *stipulas*, *flower-stalks*, and *bracteas* are similar. The *calyx-leaves* too are extended, in like manner, at the base. The whole of the herbage is minutely speckled, as in our last species, as well as in *canina*. But the plant is more or less downy, and clearly distinguished by the strongly recurved form of the *spur*, which if straight would be as long as the *lip*. The two lateral petals are downy at the base. Perhaps this species is more akin to *canina* than to any other, and ought to stand near it; at least if the *rubella* and *maculata* have no elongation at the base of their *calyx*.

64. V. *tricolor*. Pansy Violet, or Heart's-Ease. Linn. Sp. Pl. 1326. Willd. n. 24. Ait. n. 26. Fl. Brit. n. 6. Engl. Bot. t. 1287. Curt. Lond. fasc. 1. t. 65. Woodv. Suppl. t. 252. Fl. Dan. t. 623. Ger. Em. 854. Renealm Spec. 144. t. 140. Rivin. Pentap. Irr. t. 122. Ehrh. Pl. Off. n. 278. (V. n. 568; Hall. Hist. v. 1. 244. Jacea, sive Flos Trinitatis; Camer. Epit. 912.)

β. V. arvensis; Murray Prodr. Gotting. 73. Sibth. Oxon. 84. Sym. Syn. 61. (V. bicolor; Rivin. Pentap. Irr. t. 122. Ehrh. Pl. Off. n. 359. Pursh n. 22. V. n. 569; Hall. Hist. v. 1. 244. V. tricolor petræa; Ger. Em. 854. Jacea altera; Camer. Epit. 913. Corn Pansie; Petiv. Herb. Brit. t. 37. f. 9.)

Stem angular, diffuse, divided. Leaves oblong, deeply crenate. Stipulas lyrate, pinnatifid. Bracteas obsolete.—Native of cultivated ground throughout Europe, from Sweden to Greece, as well as in North America, flowering all summer long. *Root* annual. *Stems* more or less branched, especially from the bottom, angular, most hairy on one side, extremely variable in luxuriance, when simple nearly erect. *Leaves* stalked, usually ovate, deeply crenate; sometimes more oblong; and in the more starved plants of variety β merely undulated. *Stipulas* always deeply pinnatifid, with narrow tongue-shaped segments; the terminal one very large, ovate, crenate. *Flower-stalks* axillary, solitary, firm, longer than the leaves, bearing towards the top a pair of extremely minute, close-pressed, scarcely visible *bracteas*. *Calyx-leaves* greatly and unequally dilated at the base, lanceolate in front, acute, entire. *Petals* extremely variable in size and colour, from the large, splendid, velvet-like Pansy of the gardens, which if allowed to sow itself without attention, soon becomes scarcely different from the wild plant; to the small pale-yellowish variety β, whose ultimate state of degeneracy, among the scoriæ of mount Ætna, is the V. ætnica erecta bicolor hir-

suta

suta minima, of Cupani's Hort. Cath. 130, sent us by Baron Bivona. In general, however, there are two tolerably dissimilar wild varieties, as above indicated; one with the *petals* longer than the *calyx*, the two uppermost purple; two lateral whitish, ribbed with purple, hairy at the base; *lip* yellow, inversely heart-shaped, streaked with purple, ending behind in a short *spur*; the other variety (β) has *petals* of a pale yellow, or cream-colour, hardly so long as the *calyx*, but little marked with blue. The hairiness of the *calyx*, like that of the herbage in general, is certainly variable.

65. V. *pilosa*. Blue Hairy Heart's-Ease. Donn Cant. ed. 3. 40. ed. 5. 52. (V. hispida; Lamarck Franc. v. 2. 679. V. rothomagensis; Poiret in Lam. n. 45. "Decand. Franc. v. 4. 809." Desfont. Tabl. 178. Sims in Curt. Mag. t. 1498. Ait. Epit. 376.)—Stem angular, zigzag, hairy, diffuse, branched. Leaves ovate, crenate, fringed. Stipulas pinnatifid, somewhat lyrate. Bracteas lanceolate, toothed at the base.—Native of stony hills near Rouen, as well as in other parts of France, and on the downs near Dunkirk; perennial, flowering in the spring. This plant has long been universally known in our gardens, under the apt name of *V. pilosa*, given by the late Mr. Curtis, who gave us a specimen, so named, from his garden at Lambeth marsh, in May 1781. The date of its introduction is, therefore, anterior, even to what the late Mr. Donn has recorded, 1783. We had a specimen also of the same as his *V. pilosa*, from the Cambridge garden in 1803; and we regret that Dr. Sims has followed less classical authority and example, in the appellation he has retained, to the disparagement, though undesigned, of his old friends and our's. The plant in question is not very easily distinguishable, by a definition, from *tricolor*, though unquestionably a different species. The *root* is perennial. *Herb* much more hairy. *Flowers* bright blue, the side *petals* and *lip* striped with black. *Calyx* and *spur* much like *tricolor*. *Bracteas* nearer the top of the *flower-stalks*, and much larger, lanceolate, with two very evident teeth on each side at the base. This character seems material, though not yet mentioned. The reader of M. Poiret's description may, at first sight, suppose it to have been found out by him, but a slight examination will discover that author to have written *bracteas* for *stipulas*.

66. V. *lutea*. Yellow Mountain Pansy. Hudf. ed. 1. 331. Fl. Brit. n. 7. Engl. Bot. t. 721. Ait. n. 27. Poiret in Lam. n. 46. "Decand. Franc. v. 4. 809." Great Yellow Pansie; Petiv. Herb. Brit. t. 37. f. 10. (V. grandiflora; Hudf. ed. 2. 380. Lightf. 508. Ait. ed. 1. v. 3. 291; but not of Linnæus. V. flore luteo majore; Rivin. Pentap. Irr. t. 121. V. n. 566 β; Hall. Hist. v. 1. 243.)—Stem triangular, unbranched. Leaves ovate-oblong, crenate, fringed. Stipulas lobed, palmate. Bracteas minute, scarcely toothed. Spur the length of the calyx.—This plant is found in grassy mountainous pastures, flowering from May to September. It is frequent in such situations, from Sweden, if we mistake not, (see Linn. Lapland Tour, v. 1. 41.) to Britain, Switzerland, and France. A specimen before us, from the son of the great Haller, shews it to have been confounded, amongst other things, by that author, under his n. 566. The *root* is perennial. *Stem* weak and decumbent at the base, scarcely ever branched, three or four inches high, a little downy, especially at one side, leafy. *Leaves* stalked; the lowermost small, nearly orbicular. *Stipulas* large, deeply cut, their middle segments largest. *Flowers* one or two, on long solitary axillary *stalks*, rising high above the leafy top of the stem, larger than in the common *tricolor*, to which their *calyx* is similar; but their *spur* is smaller, not extending beyond the posterior lobes of that part. *Petals* mostly yellow; the two lateral ones, and the lip, streaked with black, and all more or less downy at the base; two upper ones sometimes also streaked with black or purple, or partly spotted with the latter colour; not unfrequently they are purple all over; as in Engl. Bot. The *stigma* is club-shaped, hairy, hollow, with a purple line underneath. M. Poiret has shewn great practical knowledge in his remarks under this species, adverting to *V. grandiflora*. We hope to remove his doubts in the next paragraph.

67. V. *grandiflora*. Great Mountain Pansy. Linn. Mant. 120. Willd. n. 25, excluding all the synonyms. (V. altaica; Pallas Herb. according to Dr. Sims. "Ker. Bot. Regist. 54." Sims in Curt. Mag. t. 1776.)—Stem angular, unbranched. Leaves ovate-oblong, crenate. Stipulas pinnatifid, somewhat lyrate. Bracteas minute, scarcely toothed. Spur twice the length of the hind lobes of the calyx.—Native of Siberia. Pallas is said to have gathered it on the Altay mountains. The Linnæan specimen seems of older date than the discoveries of this eminent traveller, but has no mark to indicate where it grew. This species is certainly more akin to the preceding than to the following, both which have been confounded with it. The habit and mode of growth agree with *V. lutea*, but every part is twice as large. The *stem*, weak and decumbent at the base, is about a span high, smooth, except a roughness on some of the angles, or at one of the sides. *Leaves* on longish stalks; the upper ones ovate, or ovato-lanceolate, a little hairy, not fringed; lower orbicular or heart-shaped, smooth. *Stipulas* very different from *V. lutea*, being oblong, pinnatifid in their lower half only, not palmate. *Flower-stalks* two or three on each plant, axillary, solitary, erect, five inches long, rising high above the stem. *Bracteas* an inch or more below the summit, opposite, membranous, lanceolate, extremely small, with a tooth on each side at the base. *Flowers* pale yellow, above twice the size of *V. lutea*, and of a rounder figure; their lateral *petals* hairy at the base, and marked, like the *lip*, with a few black lines. *Calyx* much dilated and toothed at its base, but not reaching half the length of the *spur*, which is cylindrical, rather slender, slightly curved, affording the most decisive distinction. The specimen represented in the Bot. Mag. seems to be the top of a plant, with rounder upper *leaves* than our wild specimens exhibit. The *flower* is unfortunately drawn so as not to shew the *calyx* or *spur*, but the description answers to our plant, except that the dried *petals* are not remarkably undulated. The Linnæan description is good, except that the *stem* is not branched. Some naked *flower-stalks* caused this error. The remark that this and *calcarata* are the offspring of *V. tricolor*, is perfectly unauthorized.

68. V. *calcarata*. Dwarf Mountain Pansy. Linn. Sp. Pl. 1325. Willd. n. 27. Ait. n. 28. (V. n. 566 α; Hall. Hist. v. 1. 243. t. 17. f. 1. V. alpina purpurea, exiguis foliis; Bauh. Pin. 199. Melanium montanum; Dalech. Hist. 1204.)

β. V. n. 566 β, n. 2; Hall. Hist. v. 1. 243. (V. Pallasii; Forst. Tr. of Linn. Soc. v. 6. 311. V. montana lutea, subrotundo crenato folio; Barrel. Ic. t. 691, et V. montana cærulea tricolor, folio subrotundo crenato; ibid. t. 692.)—Stems quite simple, hardly so long as the footstalks. Leaves ovate, crenate. Stipulas three-cleft. Bracteas toothed at the base, somewhat hastate. Spur thrice as long as the hind lobes of the calyx.—Native of the mountains of Siberia, Austria, Switzerland, Savoy, and the south of France, flowering in July and August. Generally known in gardens by the name of *grandiflora*, at least the

the variety β; which is confounded by Linnæus in his ſynonyms with the true *grandiflora;* by Haller with *lutea*. M. Poiret juſtly obſerves, that a ſpecific character of the variety β, when it was announced in Tr. of Linn. Soc. by the name of *V. Pallaſii*, ought to have been given. That name, however, is now ſuperfluous, for we are perfectly ſatisfied that no ſpecific difference exiſts between the plant there intended and the original *calcarata*. The *root* is perennial, much branched under ground, and creeping extenſively, each ſhoot crowned with a ſhort leafy *ſtem*, much overtopped, not only by the generally ſolitary *flower-ſtalk*, but by its own crowded *leaves* or their ſtalks. The *leaves* are ſmaller, thicker, blunter, more glaucous, and more uniformly ovate, than in either of the two laſt, with a few, ſlight and rounded, notches. *Stipulas* uſually longer than the *footſtalks*, in three deep ſegments, ſcarcely more, the middle one obovate, varying in breadth. They are well repreſented by Barrelier. The herb is often ſmooth, occaſionally more or leſs downy. *Flower-ſtalks* riſing high above the leaves, two or three inches long, more or leſs. *Bracteas* above the middle, lanceolate, with ſeveral lateral teeth, as if palmate, or haſtate. *Flower* generally light purple, with black lines at the bottom, larger than *V. lutea*, ſometimes parti-coloured like that; in β almoſt the ſize of *grandiflora*, with more remarkable black lines, and either yellow, parti-coloured, or all over violet. The *calyx* in both varieties is elongated, dilated, and toothed, at the baſe. *Spur* long, ſlender, cylindrical, ſlightly curved. Haller's figure is characteriſtic, but ſhews no part with critical preciſion. We have endeavoured to be explicit on the ſubject of the three laſt ſpecies, as no plants have been leſs underſtood.

69. V. *Zoyſii*. Dwarf Carinthian Panſy. Wulf. in Jacq. Coll. v. 4. 297. t. 11. f. 1. Willd. n. 26, excluding the ſynonym.—Stems quite ſimple, hardly ſo long as the footſtalks. Leaves ovate, crenate, ſmooth. Stipulas elliptic-lanceolate, undivided, nearly entire. Bracteas toothed at the baſe. Spur thrice as long as the hind lobes of the calyx.—Native of the mountains of Carniola and Carinthia, communicated by Mr. Sieber. Wulfen received it from the Baron de Zoys, whom he commemorates in the name. His deſcription and figure are complete, except that we cannot account for his citing, without ſcruple, t. 691 of Barrelier. M. Poiret makes *V. Zoyſii* a variety of *calcarata;* but they are clearly diſtinguiſhed by their *ſtipulas*, which in the preſent are always oval, never lobed, though in one or two inſtances we find a ſlight lateral notch. The *plant* moreover is ſmaller, more perfectly ſmooth, green, not at all glaucous. *Flower-ſtalks* two or three inches high, angular. *Bracteas* minute. *Petals* large, yellow, with black lines at the bottom; ſometimes partly tinged with blue. *Spur* aſcending, rather thicker than in *calcarata*, and not quite ſo long. Wulfen might well be puzzled with the determination of this plant, *grandiflora*, &c.

70. V. *ceniſia*. Violet of Mount Cenis. Linn. Sp. Pl. 1325. Willd. n. 16. Ait. n. 17. Allion. Pedem. v. 2. 98. t. 22. f. 6. Spec. 14. t. 3. f. 4. Poiret in Lamarck n. 26. (V. n. 565; Hall. Hiſt. v. 1. 242.)

β. Poiret ibid. (V. valderia; Allion. Pedem. v. 2. 98. t. 24. f. 3.)—Stems ſimple, procumbent. Leaves ovate, entire. Stipulas obovate, ſtalked, undivided, unequal. Spur thrice as long as the hind lobes of the calyx.—Native of the hill called Ronce, above the hoſpital on Mount Cenis, where we gathered ſpecimens, with Dr. Bellardi, in Auguſt 1787. It alſo grows on the alps of Savoy and Switzerland. The *roots* are creeping. The whole plant bears a reſemblance to *V. calcarata* and its allies, but has decumbent *ſtems*, two or three inches long; fleſhy entire *leaves*, either ſmooth, or rough with ſhort reflexed hairs; and very different *ſtipulas*, on long ſtalks. *Flowers* nearly the uſual ſize of *calcarata*, blue. *Bracteas* ſmall, hardly toothed. *V. valderia* is ſurely a moſt trifling variety. The *leaves* are falſely deſcribed ſinuated; and the *ſtems* are not more erect than in the original *ceniſia*.

71. V. *arenaria*. Sand Violet. Poiret in Lam. n. 25. "Decand. Franc. v. 4. 806."—"Stems ſimple, diffuſe, ſomewhat downy. Leaves roundiſh-heartſhaped, ſmoothiſh, ſlightly crenate. Stipulas lanceolate, toothed. Calyx acute."—Native of ſandy places, in the Lower Valais. *Root* ſcaly at the crown, ſending out two or three ſpreading *ſtems*, two or three inches long. *Flower-ſtalks* three or four times as long as the leaves. *Flowers* pale blue, or whitiſh, with a thick obtuſe *ſpur*. *Bracteas* linear, acute, four or five lines long, about an inch below the flower. *Decandolle. Poiret.*

72. V. *minuta*. Minute Baſil-leaved Violet. Marſch. à Bieberſt. Fl. Taur.-Cauc. v. 1. 173. (V. orientalis minima, ocymi folio; Tourn. Cor. 30?)—"Stems ſimple, flaccid, ſingle-flowered. Leaves roundiſh, crenate, nearly ſmooth. Stipulas ovate, entire."—Native of the Georgian region of Mount Caucaſus. *Root* apparently creeping. *Stems* as long as the finger-nail. *Leaves* only two or three lines in length and breadth, broadly but ſlightly crenate. *Footſtalks* about as long. *Stipulas* rough with hairs at the edges. *Flower* the ſize and ſhape of *V. odorata*, with a *ſpur* the length of the *petals*. *Bracteas* remote, very minute. Akin perhaps to *V. ceniſia* and *alpina*. *Marſch. à Bieberſt.* It may poſſibly be more related to the following, though the *ſtipulas* do not agree.

73. V. *nummularifolia*. Money-wort-leaved Violet. Allion. Pedem. v. 2. 98. t. 9. f. 4. Willd. n. 15. (V. alpina minima, nummulariæ folio; Bocc. Muſ. 163. t. 127.)—Stems tufted, ſimple. Leaves orbicular-heartſhaped, nearly entire, ſmooth. Stipulas lanceolate, membranous, three-cleft. Spur rounded, rather longer than the dilated baſe of the calyx.—Native of the rocks of Corſica, Dauphiny, and Piedmont. The long, ſlender, branching *roots* divide at the top into tufts of little, ſmooth, leafy *ſtems*, erect or decumbent, not branched. *Leaves* fleſhy, a quarter of an inch in length and breadth, obtuſe, occaſionally crenate, on ſlender *ſtalks* about twice as long. *Stipulas* half or quarter the length of the *footſtalks*, ſeſſile, unconnected with them, pale, acute, with one or two taper teeth at each ſide. *Flowers* blue, rather ſmaller than *V. odorata*, not unlike that ſpecies in ſhape. Very diſtinct from *V. ceniſia*.

74. V. *alpina*. Alpine Radical Violet. Jacq. Obſ. part 1. 21. t. 11. Fl. Auſtr. v. 3. 24. t. 242. Poiret in Lam. n. 15. (V. montana ſecunda; Cluſ. Hiſt. v. 1. 309.)—Stem ſcarcely any. Leaves nearly radical, orbicular-heartſhaped, ſlightly crenate, nearly ſmooth. Stipulas lanceolate, membranous, entire, united to the baſe of the long footſtalks. Spur rounded, twice as long as the dilated baſe of the calyx.—Native of the ſummits of the loftieſt mountains of Auſtria, flowering in July and Auguſt. Mr. Sieber, to whom we are obliged for wild ſpecimens, exactly agreeing with ſome from Jacquin, juſtly obſerves, that botaniſts in general have unaccountably neglected this ſpecies. It is not to be found in Linnæus, Murray, nor Willdenow; yet none can be more diſtinct. It ought perhaps to ſtand in the firſt ſection, as having much leſs of a *ſtem* than ſome which are placed there; but its affinity to ſeveral we have juſt deſcribed is ſo great, that it more naturally ranges with the Panſy tribe, of which it has the large concave oblique *ſtigma*. The *ſtipulas*, being laterally united to the *footſtalks*, like

like those of a rose or bramble, though hitherto unnoticed, afford a most striking and clear character. The *flowers* are deep blue, striped or spotted with black, or dark violet, nearly the size of *V. calcarata*, but with a shorter *spur*, and much shorter *flower-stalks*.

75. V. *tenella*. Little Syrian Violet. Poiret in Lam. n. 53.—"Lower leaves opposite, roundish, minute; upper somewhat alternate, oblong, obtuse; all smooth and entire. Flower-stalks rather longer than the leaves."—Native of Syria; preserved in the herbarium of professor Desfontaines. A very small plant, two inches high at the utmost. *Roots* simple, thread-shaped, whitish. *Stems* erect, very smooth, simple, slender. *Leaves* stalked. *Flower* small, on a solitary almost capillary stalk. *Poiret.* Nothing is said of the *stipulas*, *bracteas*, *calyx*, or *spur*, so that our knowledge of this species is very incomplete, and, but for the remarkable circumstance of the partly opposite *leaves*, we should scarcely have ventured to admit it without examination of a specimen.

76. V. *tridentata*. Three-toothed Magellanic Violet.—Stems procumbent. Leaves crowded, wedge-shaped, with three terminal teeth. Flower-stalks much longer than the leaves. Calyx obtuse.—Gathered by Mr. Menzies, in February 1787, on the mountains of Staten Land, growing among the snow. This little species is so different in habit from all the rest, that we know not where to place it. The numerous *stems*, an inch or two in length, compose dense tufts, and are thickly covered with alternate, closely crowded, or imbricated, fleshy, shining, smooth *leaves*, a quarter of an inch long, more resembling a *Saxifraga* than a *Viola*, each ending in three broad blunt teeth, and sometimes notched also at the sides: the base tapers down into a short broad *footstalk*. We can discern no *stipulas*, except the imbricated scales on the lower part of each branch may so be called. *Flowers* small, drooping, on thick *stalks* an inch high, rising above the top of each stem. *Calyx-leaves* ovate, obtuse, thick, somewhat gibbous at the base. *Spur* scarcely any.

77. V. *gracilis*. Slender Mountain Violet. Sm. Prodr. Fl. Græc. Sibth. n. 511. Fl. Græc. t. 222, unpublished.—Stem branched, angular, diffuse. Leaves lanceolate, somewhat crenate; the upper ones crowded, opposite. Stipulas deeply three-cleft. Spur much longer than the base of the calyx.—Gathered by Dr. Sibthorp, on the summit of the Bithynian Olympus. We have also specimens from mount Ætna, collected by Baron Bivona. The *roots* are perennial, creeping, long and very slender, much divided at the top. *Stems* slender, angular, hardly a span long; subdivided at the base; leafy in the upper part; simple, either quite smooth or very finely downy. *Leaves* on longish stalks, lanceolate or obovate, very rarely and obscurely crenate, smooth or a little downy, scarcely an inch long at the most; the lower ones alternate; upper opposite, and much crowded at the top of the stem. *Stipulas* like the leaves, but about one third as large, in three deep, stalked, obovate, entire segments, the middle one rather the largest. *Flower-stalks* axillary, few, three or four inches long. *Bracteas* rather above the middle, small, lanceolate, membranous, toothed at the base in a hastate manner. *Flowers* about the size of *V. lutea*, but somewhat more oblong, of a dull purplish-blue, occasionally yellow. *Calyx-leaves* bluntish; much elongated and toothed at the base. *Spur* slender, about the length of the *petals*. *Capsule* oblong.

This is allied to the Pansy tribe, and perhaps more akin to *V. cenisia* than any other, but very distinct, and remarkable for the opposite *leaves*; a character occurring here and there in species otherwise little related to each other.

78. V. *cornuta*. Horned Violet. Linn. Sp. Pl. 1325. Willd. n. 28. Poiret in Lam. n. 48. Ait. n. 29. Curt. Mag. t. 791. (V. n. 570; Hall. Hist. v. 1. 244. V. pyrenaica, longiùs caudata, teucrii folio; Tourn. Inst. 421.)—Stem ascending, angular, branched. Leaves heart-shaped, crenate. Stipulas sessile, pinnatifid. Calyx-leaves awl-shaped, taper-pointed; elongated and abrupt at the base, much shorter than the spur.—Native of the Pyrenées, and of mount Atlas. Ray is reported to have found this species on the Jura; but Haller asserts there is no record of any person besides having met with it in Switzerland. Professor Ortega is said to have first introduced it at Kew in 1776. The plant is hardy and perennial, now frequent in gardens, flowering in May. The *stems* form large lax tufts, producing abundance of sky-blue, or pale purple, inodorous *flowers*, of the Pansy kind. Their *lip* has a small point. The *spur* is slender, ascending, near an inch long. *Calyx-leaves* remarkably long, slender, and acute. The whole *herb* is somewhat downy, of a greyish-green. *Stipulas* broad, variable in size, usually about as long as the *footstalks*. Ray in his Hist. Plant. v. 3. 510, seems to indicate that some of the *leaves*, at least, are opposite. We have seen no instance of this.

The arrangement of the species of this ample and interesting genus might, doubtless, be greatly improved, provided any able botanist could compare the leading ones together, in a sufficiently perfect state. The *flower* being reversed in position, as in most European and American Violets; in other words, the *lip* being turned downwards, seems the natural posture, though many of Indian growth are supposed to have erect flowers. This character is not easy to ascertain in dried specimens, the only ones possible to be obtained of several of the most singular or curious kinds. We have, therefore, scarcely adverted to it. The intelligent reader will trace out the leading circumstances which have made us swerve, in part, from Willdenow's distribution, though we are conscious that much more remains to be done. In the admission of new species, we have passed over many American ones, mentioned by M. Poiret, because they are probably superseded by the labours of Mr. Pursh. We could not, therefore, undertake, nor did it appear requisite, to settle their synonymy: especially as we have reason to think the American *Violæ* are not yet all well known.

We regret that the elaborate treatise on this genus, which, for near thirty years, has been meditated by our accurate friend Mr. Forster, and which is, in fact, promised in the sixth volume of the Linnæan Society's Transactions, has never been accomplished. We are aware of the difficulty of the subject, and those who have studied it more deeply, are perhaps still more so; but we do not scruple to declare, that a full scientific botanical essay on *Viola*, might display as much skill and learning, and be made subservient to as much philosophical illustration of Botany, as any monographical subject that could be chosen.

VIOLA. See CHEIRANTHUS, LUNARIA, and TROPÆOLUM.

VIOLA *Aquatilis*. See HOTTONIA.

VIOLA *Mariana*. See CAMPANULA.

VIOLA *Matronalis*. See HESPERIS.

VIOLA *Palustris*. See HOTTONIA and PINGUICULA.

VIOLA, in *Gardening*, contains plants of the herbaceous, fibrous-rooted, perennial kind, among which the species cultivated are, the sweet-scented March violet (V. odorata); the palmated violet (V. palmata); the multifid-leaved violet (V. pedata); and the pansy violet, or heart's-ease (V. tricolor).

The

The first sort is a low creeping flower plant, which is in general very highly esteemed for its fragrance. There are different varieties of it, as the single blue and white, the double blue and white, and the pale purple; it is also found with white flowers; and it has been seen wild with double flowers. This variety is in much esteem, both for the superior size of the flowers, and their extreme fragrancy; and as they appear later, they keep up the succession.

The second sort is curious, and rare in this country, having no sweet scent to recommend it.

The last sort varies with more than two colours, as purple, blue, yellow, white, improved and enlarged by garden culture. There is the low growing, with small flowers; the larger upright, with large flowers; large Dutch, with largest flowers; variegated, yellow; purple and white flowered; yellow-flowered, with purple spots; purple, with yellow or white spots; white, with yellow and purple spots; entire yellow; deep and pale yellow; purple-flowered; scentless flowered; sweet-scented flowered.

Method of Culture.—The first sort may be increased by seeds, or parting the roots. The seeds may be sown in a bed of light earth, soon after they become ripe, in the beginning of autumn; and when they have some growth, be removed into a shady border, until the autumn, when they may be set out where they are to grow. The double-flowered sorts afford no seed. The best mode is, however, by parting the roots in the early autumn, or after they have flowered, and planting them out in the borders, or in beds at good distances; at the latter season watering them well. When intended for flowers, they should not be parted oftener than once in three or four years.

The second and third sorts succeed best by being planted in pots filled with loam and bog-earth well mixed, plunging them in the mould of a north border, where they should be protected in winter, or removed under a common hot-bed frame.

The fourth sort rises readily from scattered seeds, and may be raised by sowing the seed where the plants are to grow, in the autumn or spring.

They may likewise be increased by planting out the off-set slips of the large bushy plants, taken off with root-fibres, in the autumn or spring, in the borders, or in beds for increasing their growth. The varieties may be preserved in this way with safety.

These plants afford much variety in the borders, and other parts; and the first sort is useful for the flowers. It is proper to be planted out on the verges of shrubberies and wood-walks, as well as in tufts and patches in the borders, clumps, and other parts of pleasure-grounds; but when cultivated for the purpose of its flowers, it is best planted out in rows in beds, or in the borders, at the distance of a foot.

VIOLA, in the *Materia Medica*. The common sweet violet, or *viola odorata* of Linnæus, is perennial, grows wild in hedges and shady places, and flowers in March. The flowers of the *V. hirta*, or hairy, scentless March violet, are often substituted for the other in our markets: but this sort may be easily distinguished; the herb, by its having stalks, which trail on the ground, and bear both leaves and flowers, and by the young leaves being hairy; the flower, by the three lower petals being spotted with white, and by their want of smell. The officinal violet is the Ιον μελαν of Theophrastus, and the Ιον πορφυρουν of Dioscorides; it was also well known to the Arabian physicians, as Mesue commends its use highly in various inflammatory diseases. Viola is likewise frequently mentioned by the Latin poets, who allude to its effects as a vulnerary. The recent flowers only are now received in the catalogues of the Materia Medica: they have an agreeable sweet smell, and a mucilaginous bitterish taste; when chewed, they tinge the saliva blue; to water they readily give out both their virtue and their fine flavour, but scarcely impart any tincture to rectified spirit, though they impregnate the spirit with their flavour. These flowers, taken in the quantity of a drachm or two, are said to be gently purgative or laxative; and according to Bergius, and some others, they possess an anodyne and pectoral quality. The officinal preparation of these flowers is a syrup, which to young children answers the purpose of a purgative. This syrup is usually prepared from the petals of the cultivated violet; and Dr. Withering tells us, that at Stratford-upon-Avon, large quantities of the violet are cultivated for this purpose; but the London herb-shops are chiefly supplied from Kent. (See SYRUPUS.) This syrup is also found useful in many chemical inquiries, to detect an acid or an alkali; the former changing the blue colour to a red, the latter to a green. The seeds of violets are reported to be strongly diuretic, and useful in gravelly complaints. The root powdered, in the dose of a drachm, proves both emetic and cathartic.

That species of violet called pansy, or heart's-ease, the *viola tricolor* of Linnæus, grows in corn-fields, waste and uncultivated grounds, flowering all the summer months. By the vivid colouring of its flowers, it often becomes very beautiful in gardens, where it is distinguished by various names. To the taste, this plant, in its recent state, is very glutinous or mucilaginous, accompanied with the common herbaceous flavour and roughness. By distillation with water, according to Haase, it affords a small quantity of odorous essential oil, of a somewhat acrid taste. The dried herb yields about half its weight of watery extract; the fresh plant about one-eighth. It was formerly reckoned a powerful medicine in epilepsy, asthma, ulcers, scabies, and cutaneous complaints; but its present character is owing to its having been recommended by Dr. Starck, a German physician, and others, as a specific in the crusta lactea of children. He directs a handful of the fresh, or half a drachm of the dried leaves, to be boiled two hours in half a pint of milk, which is to be strained for use. This dose is repeated morning and evening. Bread, with this decoction, is also to be formed into a poultice, and applied to the part. He observes, that when it has been administered eight days, the eruption usually increases considerably, and the patient's urine acquires a smell like that of cats. When the medicine has been taken a fortnight, the scurf begins to fall off in large scales, leaving the skin clean. The use of the remedy is to be persisted in, till the skin has resumed the natural appearance, and the urine ceases to have any particular smell. Lewis. Woodville.

VIOLA, FRANCISCO DELLA, in *Biography*, maestro di cappella to Alfonso d'Este, duke of Ferrara, a disciple of Adrian Willaert, the master of Zarlino, and one of the interlocutors in his "Ragionamente." He was the editor of a curious work by his master Willaert, published at Ferrara, 1558, under the title of "Musica Nova."

VIOLA, in *Geography*, a river of Spain, in Guipuscoa, which rises in the mountains of Adrian, and runs into the sea, at Cumaja.

VIOLA, in *Ichthyology*, a name by which some authors have called the smelt.

VIOLA *Serotina*, the *late violet*, in *Botany*, a name given by the ancients to a garden-flower, not properly of the violet kind, but to which we, as well as they, have connected the name violet, though with a distinctive epithet, we call it *viola matronalis*, or *dame's violet*.

Pliny

Pliny is very exprefs in this diftinction, but is not fufficiently attended to in it; and by this means is mifunderftood in fome other parts of his works, where he alludes to this flower in his defcription of the colour called by the Romans *conchylius*, or *conchyliaceus color;* he fays that the deepeft degree of it was that of the flower of the *viola ferotina.* The commentators on his work have generally explained this into his faying, that the deepeft colour of this name was a blue purple, like that of the violet; but he only means that it is of a deeper red than the colour of the mallow flower, and with a proportionate mixture of purple, as there is in that flower.

VIOLARIS Lapis, in *Natural Hiftory*, a foffile body, called by the Germans *violftein*, and by many authors *lapis odore violarum*, from its having a fweet fmell when frefh broken, which has been fuppofed to refemble that of the violet.

The Germans have many ftones which have more or lefs of a fweet fmell when frefh broken, as they have many which ftink very ftrangely; the latter of thefe they call all by the common name of *fwine-ftone*, and the former, all by that of *violet-ftone*. The fubftance, however, which poffeffes this quality in the higheft degree of all others, and is, therefore, moft proper to be called diftinctly by this name, is a fpecies of talc, of the genus of the bractearia, called by Dr. Hill *bractearium niveum lucidiffimum bracteis undulatis*, or the fnow-white fhining bractearium, with undulated fcales. This is found in maffes of an extremely rude and irregular ftructure, but very compact and firm, ufually of a roundifh or oblong figure: thefe are of various fizes, from an inch or two, to a foot in diameter, and are compofed of almoft an infinite number of thin, extremely beautiful, and fnow-white plates, which are all broad, thin, and flaky, and of various fizes, and perfectly irregular in fhape and figure, and are naturally waved, bent, and curled: its fmell, when broken, is not like that of any of the known perfumes, but is a fort of mixed one, refembling that of rofes and violets together: it is very heavy, and will neither give fire with fteel, nor ferment with acid menftruums. It is common on the fhores of rivers in Italy, and in the mountains of Germany. Hill's Hift. of Foffils.

VIOLATION, the act of *violating, i. e.* forcing a woman, or committing a rape upon her.

Amnon, David's fon, violated his fifter, who was avenged by Abfalom: Tereus violated his fifter-in-law Philomela. To violate the queen, the king's eldeft daughter, or the princefs of Wales, is high-treafon.

Violation is alfo ufed, in a moral fenfe, for a breach or infringement of a law, ordinance, or the like.

Thus, we fay a violation of the law of nature, of the law of nations, of a treaty of peace, of one's oath, &c.

Violation is alfo ufed for a profanation. In which fenfe we fay, to violate a church, &c.

VIOLENT, in the *Schools*, a thing done by force. In which fenfe it ftands oppofed to fpontaneous.

A thing is faid to be violent, when affected by fome external principle; the body that undergoes it contributing nothing thereto, but ftruggling againft it.

The body, in fuch cafe, is faid to ftruggle, becaufe whatever is violent, difcompofes and diftracts a thing from its natural conftitution, and tends to deftroy it.

The fchoolmen all allow, that man, as being endued with reafon, is capable of fuffering fuch violence; but brute and inanimate bodies are not: *in brutum*, &c. *violentum non cadet.*

Violent *Motion.* See Motion.

Violent *Purging*, or *Cling*, a difeafe in fheep of the more inveterate bowel kind, which not unfrequently attacks them in fome fituations.

It is faid not to be peculiar to any foil, but appears moft frequently, and fpreads moft rapidly, where the pafture is of a foft graffy nature. It is conftantly produced by improper management, fuch as working among the flocks inconfiderately in hot fultry weather, and in crowded folds. It is thought by fome to break out moft frequently in milking time, where that practice is carried on, when the fheep lie, for fix or feven weeks in the later warm fummer months, upon the fame fpot for fome time, during the morning and evening at the *bought* or milking-place. Indeed, when fheep, from whatever caufe, lie upon the fame fpot until the ground turns foul, if the weather be foft, fultry, and warm, with thunder, or fhowers of that kind, this difeafe is much to be apprehended, and is often very fpreading and fatal.

The appearances of the difeafe are, that the fheep affected with it acquires a fickly look, the ears of it drop and hang low down, the eyes are languid, and the wool claps to the body of it. It continues for fome time to follow the flock, but moftly ftands in the fame pofition, looking to the ground. It often lies down, but foon rifes up again, and walks to a fhort diftance, during which it commonly voids fæces. The fkin is hot, dry, and fcaly, and the pulfe and refpiration quick. It eats very little, and does not chew the cud, but feems to have an unquenchable thirft. There is frequent rumbling heard in the bowels, followed by the difcharge of fæces, which are thinner than ordinary, having little or no refemblance to the hard purl of healthy fheep. As the difeafe advances, the purging increafes, the difcharge becomes thinner, is firft mixed with blood, then flime and blood, and at laft is black and fetid, accompanied clearly with fevere gripes and ftraining. After a wet fummer, the difcharge is fometimes green, the grafs feeming to pafs with little change of colour. In the mean time, the fheep rapidly waftes away, and in a few days is reduced to a perfect fkeleton, with its belly drawn up to its back; it feparates from the flock, wanders about in an unfteady manner, and hides itfelf among fern, heath, or bufhes, when they are prefent. Its eyes are fuffufed with red, its breathing becomes more laborious, an unpleafant fmell exhales from every part of its body, its fæces are abfolutely putrid, it is quite overcome by the difeafe, and it continues ftraining and purging until it expires.

It is faid, in the third volume of the Tranfactions of the Highland Society of Scotland, to be diftinguifhed from the ordinary diarrhœas and loofeneffes in thefe animals, by their chiefly attacking hogs, weak-gimmers and dinmonts, while this difeafe is frequent among older fheep; by their moftly occurring in the fpring and ceafing in the fummer, when this difeafe only commences; by their having no fever, ftraining, or pain before paffing the ftools, as is the cafe in this difeafe; by the fæces in them being loofe, but natural in other refpects, and without blood or flime, while in this difeafe they confift of hard lumps occafionally paffed, the reft being blood and flime; by there not being that degree of fetor in the fæces in them, that takes place in this difeafe; by the appetite being rather fharper than ufual in them, while in this difeafe it is wholly gone; by there being nothing infectious in them, while this difeafe is often greatly fo; by there being only a temporary ftop put to the thriving of the fheep, which afterwards becomes rapidly ftrong and vigorous in them, while in this difeafe the animal waftes fuddenly; and by their having little danger in them for the moft part, except where there is much debility, while this difeafe is very commonly fatal.

According to fome, if a fheep furvives this difeafe for a fort-

fortnight, or even for a few days, it mostly recovers. In this case, there is either very little or no blood in the fæces, the slime dries up, and becomes mixed with hardened balls, the feverish heat abates, the skin gets moist, the vigour of the eye returns, the appetite increases, and the wool rises slowly, and assumes its natural appearance, though a great part of it frequently comes off. However, it grows again, and sheep which have had this disease commonly become very healthy and sound, being seldom attacked by any other disease. In some cases there is the feverish appearances without any flux at all, which is a less fatal and of course more favourable state of the disease.

Notwithstanding the disease is always originally produced by improper management, it is often greatly infectious, and spreads rapidly among the same flocks and to different ones. It is a very dangerous sort of disorder, which on soft soils destroys the greater number of sheep attacked with it, but which on dry hard land is less fatal and less infectious.

In preventing the disease, which is more certain and beneficial than any thing that can be done in the cure of it when it is formed, the principal circumstances to be regarded are, the dispersing the sheep as equally as possible over the land; the preventing their collecting together in clumps and fouling the land; the having the situations for the *boughts* in milking time, high, dry and airy, shifting them often, and dividing the sheep equally among them, to prevent their being too much thronged and heated; the changing those situations frequently, where they lie, before they become foul; the removing the diseased sheep immediately as they become affected to some considerable distance; the using of tar to the noses and tails of the sheep, as well as in tubs where they are confined; and the salving of many of the sheep, and putting them in clean pastures, to lie at their ease. The disease however sometimes continues, in spite of these means, until the frost sets in, when it disappears slowly with much loss.

The cure of the disease is to be attempted, when the sheep are strong and in good condition, by cutting the tails across, and afterwards causing them to perspire in some way or other freely, not letting them be suddenly exposed to cold after it. At the same time the bowels are to be cleared by the use of a little rhubarb, as about half a drachm, or, what is better, by about four grains of ipecacuanha in powder, given until they purge freely. A quantity of thin flour-porridge well boiled, and barley or oatmeal, may then be given with a pint of sweet milk two or three times a day. If the disease be not soon removed by these means, remedies of the powerful astringent kind must be had recourse to, with opium in small quantities, such as a decoction of logwood, bark, Japan earth, and chalk made with milk, and given in the proportion of a gill two or three times a day. Fifteen or twenty drops of the tincture of opium may be put in each dose of the decoction. And it is often very useful when taken alone in a very little cold water.

VIOLET, in *Botany*, *Gardening*, and the *Materia Medica*. See VIOLA.

VIOLET, *Bulbous*, a name sometimes given to the snowdrop, a plant which Linnæus makes a distinct genus under the name *galanthus*; but which Tournefort comprehends among the *narcisso-leucoiums*.

VIOLET, *Calathian*. See GENTIANA *Pneumonanthe*.

VIOLET, *Corn*, a name sometimes applied to the *Campanula hybrida*.

VIOLET, *Damask*. See HESPERIS.

VIOLET, *Dame's*, *Rocket*, or *Queen's Gilliflower*. See HESPERIS.

This plant is an antiscorbutic and diaphoretic, and is very serviceable in the asthma, coughs, and convulsions. The outward use of it is recommended in inflammations, cancers, gangrenes, sphacelus, and contagious diseases. Bruised, it very potently resists putrefaction; and applied to pestilential buboes in the arm-pits, it ripens and softens them. James from Boerhaave.

VIOLET, *Dog's-tooth*, the name by which some call the *dens canis* of botanical writers. See ERYTHRONIUM.

VIOLET, *Water*. See HOTTONIA.

VIOLIN, an instrument of four strings, tuned fifths, and played by a bow. It has a neck like the treble viol, but the finger-board has no frets. This may be pronounced the most powerful, the most perfect, and the most useful instrument that has ever been invented. It is in the power of the performer on this sovereign of the orchestra, to make the intonation of all keys equally perfect. We have not been able to trace its antiquity higher than the 16th century. In the beginning of the 17th century it was hardly known to the English in shape or name; and, therefore, that superior power of expressing almost all that a human voice can produce, except the articulation of words, seemed at this time so utterly impossible, that it was not thought a gentleman's instrument, or one that should be admitted into good company. Viols of various sizes, with six strings, and fretted like the guitar, began indeed to be admitted into chamber-concerts: for when the performance was public, these instruments were too feeble for the obtuse organs of our Gothic ancestors; and the low state of our regal music in the time of Henry VIII. 1530, may be gathered from the accounts given in Hall's and Hollingshead's Chronicles, of a masque at cardinal Wolsey's palace, Whitehall, where the king was entertained with "a concert of drums and fifes." But this was soft music compared with that of his heroic daughter Elizabeth, who, according to Henxner, used to be regaled during dinner "with twelve trumpets and two kettle-drums; which, together with fifes, cornets, and side-drums, made the hall ring for half an hour together." Itinerarium, edit. 1757, Strawberry-Hill.

It has long been a dispute among the learned, whether the violin, or any instrument of that kind, as now played with a bow, was known to the ancients. The little figure of Apollo, playing on a kind of violin, with something like a bow, in the grand duke's tribuna at Florence, which Mr. Addison and others supposed to be antique, has been proved to be modern by the abbé Winckelmann and Mr. Mings. So that as this was the only piece of sculpture reputed ancient, in which any thing like a bow could be found, nothing more remains to be discussed relative to that point. With respect to an instrument with a double neck, besides that on the broken obelisk at Rome, and one from a sepulchral grotto in the ancient city of Tarquinia, there is an antique painting in the collection of William Locke, esq. which consists of a single figure, supposed to be a muse, with an instrument nearly in the form of a modern violin, but the neck is much longer, and neither bow nor plectrum are discoverable near it. This, as Dr. Burney apprehends, may have been a chelys, which was a species of guitar, either thrummed by the fingers, or twanged with a quill. The ancients had, indeed, instead of a bow, the plectrum; but in all the representations which painting and sculpture have preserved of this implement, it appears too clumsy to produce from the strings tones that had either the sweetness or brilliancy of such as are drawn from them by means of the bow or quill. Dr. Burney supposes, though it is represented so massive, that it was a quill, or piece of ivory in imitation of one, rather than a stick or blunt piece of wood or

or ivory; and, indeed, Virgil tells us, Æn. vi. 647, that it was made of ivory. Burney's Hist. Muf. vol. i.

The origin of the violin, according to the French account, is unknown. It is only fuppofed to have been invented about the ninth or tenth century, to which opinion we fhould have fubfcribed, had not fome ancient monuments remained with an exact reprefentation of its form. In the pictures of Philoftratus, p. 85, in an ancient grotto, may be feen many violins which are reprefented much like thofe of the prefent times, except that the neck is fhorter.

Amphion is there reprefented, p. 76, playing upon a kind of viol or violin with five ftrings, and with a bow like our's, and quite different from the plectrum of the ancients. It is believed that Athenæus means the bow, when he fays, "the fceptre is one thing and the plectrum another." It is imagined that by the fceptre he means the bow, which is very probable, efpecially after the ancient monuments of which we have preferved the figure. The pit or grotto, on the walls of which we fee violins like the prefent, is found on filver medals which were ftruck by order of Scribonius Libo, a very confiderable perfonage at Rome. An account of thefe may be feen in Pierre Valerien, author of the Hieroglyphics, book 47.

This is all that antiquity has preferved concerning the violin, and, fays the author, it is fo little, that we learn nothing from it.

The rebec is the moft ancient violin in France; it had but three ftrings, and the romancers and troubadours frequently mention it. A figure of the minftrel Colin Mufet, is ftill preferved at the entrance of the church of St. Julien des Meneftriers, at Paris, playing on the rebec.

The time is not known when a fourth ftring was added to this inftrument. It is ftill ufed in its primitive ftate as a trichord in Turkey and other Eaftern countries; the oldeft violins we have in France are not more ancient than the time of Charles IX. made at Cremona by the famous Amati, which are ftill of the beft model poffible. Laborde, tom. i.

The violin feems to have been brought into favour at the court of France before any honourable mention is made of it elfewhere, by the arrival of Baltazarini, a great performer on that inftrument; who, at the head of a band of violin-players, was fent from Piedmont by marfhal Briffac to Catharine de Medicis, and appointed by that princefs her firft valet de chambre and fuperintendant of her mufic. Galilei (Dial. p. 147.) fays, that "both the violin and bafe, or violoncello, were invented by the Italians, perhaps by the Neapolitans;" and we are unable to confute that opinion. Corelli's violin, long in the poffeffion of Giardini, was made in 1578, and the cafe painted by Annibal Caracci, probably feveral years after the violin was finifhed, at which time Anib. Carach was but eight years old. Montagne, who was at Verona in 1580, fays that there were organs and violins to accompany the mafs in the great church. Journ. du Voyage.

The reftoration of monarchy and epifcopacy feems to have been not only favourable to facred mufic, but fecular; for it may be afcribed to the particular pleafure which king Charles II. received from the gay and fprightly found of the violin, that this inftrument was introduced at court, and the houfes of the nobility and gentry for any other purpofe than country-dances, and feftive mirth. Hitherto there feem to have been no public concerts; and in the mufic of the chamber, in the performance of *fancies* on inftruments, which had taken place of vocal madrigals and motets, the violin had no admiffion, the whole bufinefs having been done by viols.

After Charles had, in imitation of Lewis XIV., eftablifhed a band of twenty-four violins, tenors, and bafes, inftead of the viols, lutes, and cornets, of which the court band ufed to confift, the violin family began to rife in reputation, and had an honourable place affigned it in the mufic of the court, the theatres, and the chamber; and the fucceffion of performers and compofitions with which the nation was afterwards fupplied from Italy and elfewhere, ftimulated the practice and eftablifhed the character of that clafs of inftruments, which have ever fince been univerfally acknowledged to be the pillars of a well-ordered orcheftra. A general paffion for this inftrument, and for pieces exprefsly compofed for it, as well as a tafte for Italian mufic, feem to have been excited in this country about the latter end of Charles II.'s reign, when French mufic and French politics became equally odious to a great part of the nation. The Hon. Mr. North, brother of the lord keeper North, who liftened critically to every kind of mufic, and left manufcript memoirs of the mufic of his time, ftill in the poffeffion of his family, fays, that the decay of French mufic, and favour of the Italian, came on by degrees. Its beginning was accidental, and occafioned by the arrival of Nicola Matteis.

During the laft century, almoft all the great violinifts of Europe, except Somis and Tartini, have vifited this country; but Giardini, at one time perhaps the beft performer in Europe, refiding here fo many years, formed a fchool which furnifhed our orcheftras with a greater number of able performers on that inftrument, than can be found in the capital of any other kingdom in Europe. And we may venture to affert from our own knowledge, that the loweft ripieno in the opera orcheftra at prefent, has more hand, and is a better fight's-man, than the leader of that band in Fefting's time.

The violin confifts, like moft other inftruments, of three parts; the *neck*, the *table*, and the *foundboard*.

At the fide are two apertures, and fometimes a third towards the top, fhaped like a heart.

Its bridge, which is below the apertures, bears up the ftrings, which are faftened to the two extremes of the inftrument; at one of them by a fcrew, which ftretches or loofens them at pleafure.

The ftyle and found of the violin are the gayeft and moft fprightly of all other inftruments; and hence it is, of all inftruments, the fitteft for dancing. Yet there are ways of touching it, which render it grave, foft, languifhing, and fit for church or chamber mufic.

It generally makes the treble, or higheft parts in concerts. Its harmony is from 5th to 5th. Its play is compofed of bafe, counter-tenor, tenor, and treble; to which may be added a fifth part: each part has four 5ths, which rife to a greater 17th.

In compofitions of mufic, violin is expreffed by V: two V V denote two violins.

The word violin, alone, ftands for treble violin: when the Italians prefix *alto*, *tenore*, or *baffo*, it then expreffes the counter-tenor, tenor, or bafe violin.

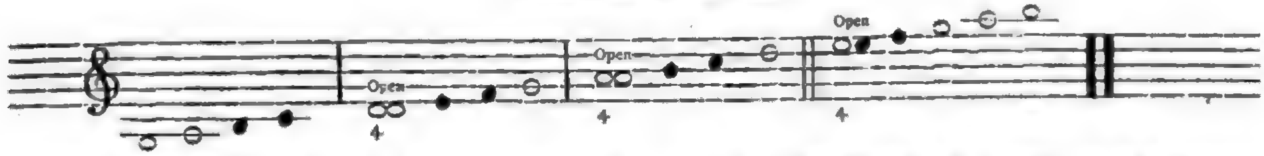
In compofitions where there are two, three, or more different violins, they make ufe of *primo*, *fecundo*, *terzo*, or of the characters I° II° III°, or 1° 2° 3°, &c. to denote the difference.

The violin has only four ftrings, each of a different thicknefs, the fmalleft of which makes the *e fi mi* of the higheft octave of the organ; the fecond, a fifth below the firft, makes the *a mi la*; the third, a fifth below the fecond, is *d la re*; laftly, the fourth, a fifth below the third, is *ge re fol*. Moft nations, ordinarily, ufe the clef *ge re fol* on the fecond line, to denote the mufic for the violin; only, in France,

France, they uſe the ſame clef as the firſt line at bottom: the firſt of theſe methods is beſt, where the ſong goes very low; the ſecond where it goes very high.

Merſennus ſpeaks of the tenor and contra-tenor violin, which, he ſays, differ only in magnitude from the treble violin. But we have at preſent no ſuch inſtrument in uſe as the contra-tenor violin; the part proper to it being with eaſe performed on the violin; and accordingly in concertos, overtures, and other inſtrumental compoſitions of many parts, the ſecond violin is in reality the counter-tenor part. It is much to be doubted, ſays ſir John Hawkins (Hiſt. Muſ. vol. iv. p. 115.) whether the counter-tenor violin ever came into England. Anth. Wood, ſpeaking of the band of Charles II., makes no mention of the contra-tenor violin. Before the reſtoration of Charles II. ſays he, and eſpecially after, viols begun to be out of faſhion, and only violins uſed, as treble violin, tenor and baſe violin; and the king, according to the French mode, would have twenty-four violins playing before him while he was at meals, as being more airy and briſk than viols.

Natural Scale for the Violin.



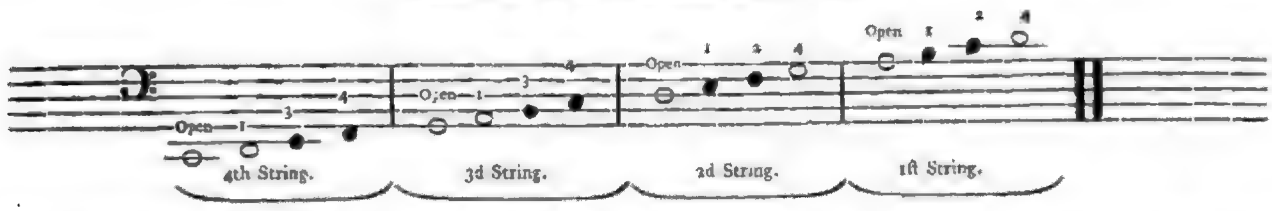
VIOLINO Piccolo, Ital. a kit, or the pocket-violin of dancing-maſters.

Violino *Scordato*, Ital., a fiddle out of tune.

VIOLONCELLO, the diminutive of *violone, contrabaſſo*, or double-baſe. The violoncello is the natural baſe to the violin and tenor, and has been very much cultivated throughout Europe, and no where more ſucceſsfully than in England, during the laſt century, in proportion as the baſe-viol or ſix-ſtringed baſe loſt its favour. The laſt Engliſh performer on the viol di gamba, who was favourably noticed, was Miſs Ford, afterwards Mrs. Thickneſs; but ſhe made little more uſe of it than in accompanying her voice, which ſhe did with great expreſſion and effect. But Abel, in ſpite of the natural defects of the inſtrument, the tone of which every one diſliked, by his exquiſite taſte, prodigious execution when he pleaſed, genius, and profound knowledge of compoſition, delighted all hearers, and made them forget, or at leaſt forgive, its querulous and naſal quality of tone. The inſtrument now is as dead as this great muſician, and ſeems to have departed this life at the ſame time.

The firſt performer on the violoncello in our memory, who was always heard with pleaſure, was Caporale, whoſe chief excellence was his fine tone. Gordon and Paxton had conſiderable merit of that kind. The elder Cervetto and Paſqualino, both defective in tone, had what was then thought conſiderable execution and knowledge of the finger-board; but Croſdil and the younger Cervetto became in all reſpects the moſt complete and delightful performers on the violoncello, which not only England but all Europe can boaſt. So equally perfect in all things elſe are theſe admirable artiſts, that the fire of the one, and the vocal tone of the other, can alone diſtinguiſh them. But, to the great regret of the public, they have retired from all profeſſional exerciſe of their talents. We have however many performers on the violoncello for general buſineſs, who would have been thought wonderful players formerly; and to conſole us a little for the loſs of Cervetto and Croſdil, a Linley, who in every requiſite of a great player, may be pronounced wonderful at preſent (1804).

Diatonic Scale of the Violoncello, without Shifts.



VIOLONE, a double-baſe, almoſt twice as big as the common baſe-violin, and the ſtrings bigger and longer, in proportion; and, conſequently, its ſound an octave lower than that of our baſe-violin; which has a noble effect in great concertos; but this depends upon the number of ſtrings, and the manner of tuning them; ſome performers uſing four ſtrings, and others three; and in the tuning of theſe there is a conſiderable difference. The true uſe of the violone is to ſuſtain the harmony, and in this reſpect it has a noble effect: divided baſes are improper for it, the ſtrings not anſwering immediately to the percuſſion of the bow: theſe can only be executed with a good effect on the violoncello, the ſounds of which are more articulate and diſtinct.

VIOLONISTA, Ital., a performer on the violin.

UJON, in *Geography*, a town of Perſia, in the province of Chuſiſtan; 35 miles N.N.W. of Eſtachar.

VIOTTI, ——, in *Biography*, a good compoſer and great performer on the violin. He is a native of Turin, and ſaid to be the ſon of the prince de Carignan's gardener, and intended by his father to be brought up to his own profeſſion, diſcouraging as much as poſſible his paſſion for muſic, which he early diſcovered; and even complaining to the prince that he ſhould never make a gardener of him, as he was always ſcraping upon a bad fiddle. The prince adviſed his father to ſend him to Pugnani, and if he diſcovered in him the ſeeds of genius and promiſing talents, he would prevail on him to take the boy as a ſcholar or an apprentice.

Pugnani immediately diſcovered, that with proper cultivation, he would ſoon diſtinguiſh himſelf among profeſſors of the firſt claſs; an opinion which a few years confirmed.

In 1783 he went to Paris, and firſt performed at the concert ſpirituel, was extremely applauded, and increaſed in favour

favour till the time of the Revolution, when the Convention invited foreigners to assist them with their counsel in framing a new government, and elected as deputies many strangers; among the rest, Viotti was chosen a member of the senate, who had mounted to great eminence in his profession, and was a favourite of the public.

He continued to act as a deputy till Danton, Marat, and Robespierre had disgraced the cause of liberty, and excited such horror as well as terror in every humane breast, that he emigrated to England, where he was received as his professional merit deserved; till an information was lodged against him at the duke of Portland's office (perhaps by jacobinical emissaries from Paris), that he attended jacobinical clubs, and was caballing against the state. He was ordered to quit the kingdom; but at the peace returned, though not as a musician or a politician, but established himself in London as a wine-merchant, and has never been heard in public since his second arrival, which is much lamented by the lovers of music. Yet, though he is no longer a public performer, we may, perhaps without impropriety, give our sentiments concerning his abilities as a composer; and confess, that it has often struck us, in the midst of our sincere admiration of Viotti's great abilities, that his style of composition was a *mescolanza dell' antica e moderna*; writing sometimes with all the solidity of the great Italian masters of the old school, and sometimes with the levity and frivolity of the French in modern times. He may perhaps have done this insensibly, in trying to please in a style which was the most certain of applause. We have sometimes, in his grave and elaborate movements, thought he resembled Geminiani more than any other old master, with more rhythm and pathos, and indeed with more decided and meditated plans and subjects; but in his latter movements and finales, he generally degenerates into French *naiveté*, or rather *niaiserie*, which makes us forget that Viotti is a native of Italy, and a disciple of Pugnani, whom he greatly surpasses, when he does his best, both in hand and genius.

He has been a considerable publisher of pieces for his instrument, which, though every one cannot play, yet all admire, when played.

In 1786, he published at Paris, Berlin, and Amsterdam, twelve violin concertos, in nine and twelve parts; and the next year six violin quartets. Most of his pieces have been adapted to the piano-forte by other masters. The last work which he published at Paris, was six duets for violins.

VIOR, or DIUR, in *Ancient Geography*, a river of Africa, in Mauritania Tingitana, according to Pliny and Ptolemy. Hardouin says that it is now named Sus; a river of which name is known on the confines of the kingdom of Morocco.

VIORNA, in *Botany*, an old synonym of our common Traveller's Joy, *Clematis Vitalba*, and evidently of a similar meaning, being derived from *via*, a road, and *orno*, to adorn. Gerarde, who thus explains the word, declares himself the author of the English name. *Viorna* is transferred by Linnæus to another species of *Clematis*, with which it had originally no connexion. See CLEMATIS.

VIPACH, in *Geography*. See WIPACH.

VIPALANKA, or UJ PALANKA, a fortress of Hungary, in the bannat of Temesvar, on a small river which runs into the Danube; 50 miles S. of Temesvar. N. lat. 45°. E. long. 21°.

VIPAO, a river of Carniola, which runs into the Lisonzo, in the county of Goritz.

VIPATORE, a town of Hindoostan, in Baramaul; 28 miles E. of Darempoury.

VIPER, VIPERA, in *Natural History*, the *coluber berus* of Linnæus, famed not only for the exceeding venomousness of its bite, which is one of the most dangerous poisons in the animal kingdom, but also for the great usefulness of its flesh in medicine; whence vipers come to make a considerable article in the materia medica.

We have described the common viper, as well as some other species, under the article COLUBER, and have detailed some of the most interesting particulars relating to this animal. Under the article POISON, we have considered the nature of its venom, and some of the usual remedies applied as antidotes to its pernicious and usually fatal effects. We shall not here repeat the observations that may be found under those articles.

The method of catching vipers is by putting a cleft-stick on or near their head, after which they are seized by the tail, and put into a bag.

Dr. Mead observes, that the ancients esteemed the viper sacred; and that the kings of the East Indies caused cottages to be built for their entertainment, and their killers to be punished with death. On medals, the viper is frequently represented as a symbol of divine power; and, as such, given by way of attribute to the ancient physicians.

The story of the rattle-snake's charming its prey has been seriously discredited or ridiculed by many, and by others the effects of the animal's fear have been supposed the result of a previous bite; but we have reason to be less incredulous, if we advert to an experiment mentioned in the Philosophical Transactions, of a like thing in regard to a viper. It is well known that no viper will feed while in confinement, except a female which is with young, but that such a one will. A viper-catcher, who had more than sixty living vipers in a chest, put a living mouse in among them; there happened to be one female big with young among these, none of the others at all regarded the mouse, but she raised up her head a little, and looked furiously at it. The mouse was terrified, and stood still for a considerable time, though the viper continued rolled up in a spiral, only raising up its head and looking at it, and vibrating its tongue; the mouse at length recovered from its fright, and began to move, but without running away, only walking in a terrified manner round and round the viper, and often squeaking; at length she came before the head of the creature, which was still raised, and the mouth open. The mouse, after some time, went up to the creature, and crept into its mouth, where she was gradually swallowed without the viper's altering its posture.

By Mr. Boyle's experiments made upon vipers *in vacuo*, it appeared, that on the withdrawing of the air from the vessel where the viper was put, she began to swell, and after some time, she opened her mouth very wide, and frequently; but on continuing two hours and a half in the receiver, she did not appear to be quite dead. The gaping of the jaws was attended with a loss of the swelling, observed at first in her whole body; but after every time closing them she swelled again, and thus became lank and plump reciprocally many times in an hour. During the first moments this creature crawled about, as if in search of air, and afterwards foamed at the mouth.

The neck and body continued swelled longer in a second experiment with another viper, and a blister appeared on the back. This creature lived an hour and a half. The mouth remained vastly distended after death, and the internal parts of it were much distorted, and thrust forwards. After the admission of the air the mouth closed, and opened again after a time; and, in fine, on pinching the tail there was some motion perceived in the body that seemed to argue life. The common snake bears the exhausted receiver

better

better than the viper, and, after many hours remaining in it, and feeming dead, will give figns of life on being warmed by bringing the glafs to the fire; but a longer continuance in the rarefied air abfolutely kills it, as it does all other creatures. Phil. Tranf. No. 62.

As to the manner in which the viper conveys its poifon, authors are a little difagreed. Francifco Redi, and Moife Charras, have each of them written very curious pieces on the fubject; but their refult is very different.

Redi maintains, that all the venom of the viper is contained in the two veficulæ, or bags, which cover the bafe of the two canine teeth; whence, upon biting, a yellowifh liquor is fqueezed out into the wound; where, mixing with the blood, and other juices, it produces thofe dreadful fymptoms. This hypothefis he maintains by a great number of experiments; as of animals, *viz.* cocks, &c. being bit with vipers, after thefe veficulæ and their juice had been taken out, without any figns of poifon, or any ill confequence at all.

Charras, on the other hand, maintains, that this yellow liquor is not poifonous; that he has given it to pigeons as food, without their being at all difordered by it; that the viper's bite he has always found mortal to animals, even after the bag has been taken clear out, as well as before; and laftly, that the poifon muft lie in the irritated fpirits of the viper, which it exhales in the ardor of its biting, and which are fo cold, that they curdle the blood, and ftop the circulation.

The controverfy between thefe two ingenious authors is very extraordinary; their fyftems are oppofite, yet both are maintained by a great number of well-attefted experiments.

Dr. Mead fuppofes the fentiment of Sig. Redi to be the true one, in his effay on the poifon of the viper, and adds to Redi's account, that the poifon in the viper's bag is feparated from the blood by a conglomerate gland, lying in the lateral interior part of the os fincipitis, behind the orbit of the eye; from which gland there is a duct that conveys the poifon to the bags at the teeth. The teeth, he adds, are tubulated, for the conveyance and emiffion of the poifon into the wound; but their hollownefs does not reach to the apex, or tip of the tooth, but ends in a long flit below the point, out of which flit the poifon is emitted.

Thefe flits, or perforations of the teeth, Galen tells us, the mountebanks of his days ufed to ftop with fome kind of pafte; after which they would publicly expofe themfelves to be bitten without danger.

The abbé Fontana, in a treatife on the poifon of the viper, firft publifhed in Italian, in 1765, and, in 1776, tranflated into French by M. Darcet, who has made feveral additions to it, has given the refult of no lefs than fix thoufand experiments, in which upwards of four thoufand animals were bitten, and moft of them killed by the vipers.

The viper, he fays, has fometimes four, feldom three, but generally two canine teeth in each jaw, falcated and inferted and fixed in a focket; at their bafes, and behind them, are fix or feven fmaller teeth, adhering by a membrane, which, it is thought, are intended to fupply the place of the larger teeth, fometimes loft in the act of biting. A fimilar conjecture, with refpect to the ufe of the fame kind of teeth in the rattle-fnake, was made by Dr. Bartram. Phil. Tranf. No. 456. p. 358; or Abr. vol. ix. p. 60.

Each of thefe has two cavities; one tubular, beginning near the bafe, and proceeding along the convex fide nearly to the end, and open at each end; the aperture near the bafe being almoft elliptical, and the other longitudinal; the other cavity, fituated behind the former, and never before obferved, is broad at the bafe, and diminifhes as it approaches towards the point. It has only one aperture at the infertion in the gum, through which the nerves and blood-veffels of the tooth are admitted. The fibrous fheath, that covers all thefe teeth, feems to be a continuation of the external membrane of the palate, being always open near the points of the teeth. The receptacle of the venom is a fmall bladder, a fpongy gland, fituated under the mufcles of the fide of the upper jaw, and feldom containing more than three or four drops of a yellow fluid, which is conveyed thence by an excretory duct to the focket of the canine teeth, whence it enters the lower aperture of the tube, and finds its way out again at the longitudinal orifice, near the point, into the internal part of the wound occafioned by the bite: this fluid receives its impulfe from a conftrictor mufcle, which, however, never propels at once the whole of the contents of the gland. For an account of the effects of the viper's bite, we refer to COLUBER, BERUS, and POISON. See alfo WOUNDS.

The cure of the venomous bites of vipers feems very unfettled: Mr. Boyle found a hot iron held near the place very fuccefsful; but it proved otherwife with M. Charras. Again, the fnake-root from the Eaft Indies, immediately applied to the place, is much commended; but fignor Redi and M. Charras found it of no ufe; yet Baglivi and Dr. Havers give inftances of its good fuccefs.

Dr. Mead adds, that the fnake-ftone, directly applied to a pigeon when bitten, faved its life four hours; whereas moft of the other pigeons bitten died in half an hour.

This ftone is not natural, but factitious; its virtue lies in its porofity, which is fuppofed to imbibe the virus.

The viper-catchers, Dr. Mead adds, have a fpecific, in which they can fo far confide as not to be afraid of being bitten.

That fpecific is, the axungia of the viper prefently rubbed into the wound; which, confifting of clammy, vifcid, penetrating and active parts, fheathes the falts of the virus.

The fame author applying it to the noftrils of a dog bitten, found the creature well the next day: when this is not timely applied, and the virus has infinuated into the blood, the fal viper is excellent, given and repeated till fweats be produced. This fucceeded well with M. Charras; and Dr. Mead relates, that it recovered one after the virus had induced an univerfal icterus.

The bite of the viper having been fuppofed certainly curable by oil of olives, vulgarly called fallad-oil, alone; and a viper-catcher in England having fuffered himfelf to be bitten by one of thefe creatures, and having recovered, after many dangerous fymptoms, and the cure being attributed to the oil alone, though other medicines were given him internally; in confequence of which, Dr. Vater tried the fame remedy with fuccefs at Drefden: Meffrs. Geoffroy and Hunauld, of the Royal Academy of Sciences at Paris, made a number of experiments, in which this oil proved ineffectual; and added to their accounts, fome other perfons bitten, in which all the dreadful confequences of that poifon are fhewn, and the remedies by which they were cured are mentioned. Philof. Tranf. N° 443, 444, 445; or Abr. vol. ix. p. 60.

Two inftances are mentioned, in which the fymptoms of the bite appeared much in the fame manner with thofe of the man who fuffered himfelf to be bitten in England, in order to be cured by the oil. The fleep came on in all the fame circumftances, and they were all cured, as well he who

who used no unctuous application at all, as he who used the fat of the vipers, or the Englishman who depended upon oil. The internal medicines given to them all were of much the same kind; and all that can be concluded from the whole is, that either these bites would not have proved mortal in themselves, or that the cordial medicines which they took internally, were the remedies that prevented the mischief that would have ensued; and these seem to have acted not as specifics against the bite of this animal, but merely as medicines that would stop the spreading of a gangrene; the unprevented increase of which is the thing that proves fatal from the creature's bite.

The dissections of the animals which had died by the bite of the viper, whether they had or had not been rubbed with oil, afforded all the same appearances. The limb which had received the wound was in all swelled and livid, and these symptoms were usually carried along the thigh to the belly, and sometimes up to the breast. Incisions made along these parts always discovered the cellules of the membrana adiposa full of bloody-coloured water, and the membrane itself was swelled, blackish, and gangrened. And this appeared always more plainly in the belly than in any other part: the membrana adiposa in all other parts of the body was in its natural state. The injured parts often had a cadaverous smell; the muscles of the wounded limb were also found of a brownish colour, and their fibres had lost their consistence, and seemed ready to give way to the approaching gangrene. Nor is this effect confined to the external parts alone: a goose that had been bitten had three gangrenous spots on its heart, and all the indications of a beginning gangrene in other parts of it; the concave side of the liver was also gangrened, and had wholly lost its consistence; and the lungs of a fowl, that had been bitten on the wing, were found in part gangrened. The effects, however, were different in degree, from the bite of the several vipers; and there seems no reason to doubt, but that the bites of different animals, though of the same species, under different circumstances, either in regard to the creature wounding, or the creature wounded, may be followed with very different consequences; so that remedies are not to be depended on from their success in one or two trials. Mem. Acad. Scienc. Par. 1737.

The poison of the viper is only noxious when immediately conveyed into the blood. Nor is it mortal to eat the flesh of creatures killed by vipers, or to drink the wine in which they have been drowned, or to suck the parts they have wounded. On the contrary, signor Redi says, sucking the wound is a sovereign remedy against the bite of vipers. This author denies what has been affirmed by Aristotle and Galen, that the spittle of a fasting person kills vipers. Phil. Transf. N° 9. p. 160.

The practice of sucking out poisons is very ancient, and indeed nothing can be more rational. Where the bite cannot be cut out, this is the most likely way for extracting the poison. There can be no danger in performing this office, as the poison does no harm, unless it is taken into the body by a wound. The person who sucks the wound ought, however, to wash his mouth frequently with sallad-oil, which will secure him from the least inconvenience.

The Psylli in Africa, and the Mersi in Italy, were famed for curing the bites of poisonous animals, by sucking the wound; and we are told that the Indians in North America practise the same at this day.

When the wound is well sucked, it should be afterwards rubbed with warm sallad-oil. A poultice of bread and milk, softened with sallad-oil, should likewise be applied to it, and the patient should drink freely of vinegar-whey, or water-gruel with vinegar in it, to make him sweat. Vinegar is, indeed, one of the best medicines which can be used in any kind of poison, and ought to be taken very liberally. If the patient be sick, he may take a vomit. This course, says Dr. Buchan, will be sufficient to cure the bite of any of the poisonous animals of this country.

Dr. Brookes says, that the following remedy, which was the invention of a negro, who for the discovery obtained his freedom and a pension for life of 100*l.* *per annum*, from the general assembly of Carolina, has been found effectual for the bite of the rattle-snake. The prescription is as follows: Take of the roots of plantain and horehound in summer, roots and branches together, a sufficient quantity; bruise them in a mortar, and squeeze out the juice, of which give, as soon as possible, one large spoonful; if the patient be swelled, force it down his throat. This generally will cure: but if he finds no relief an hour after, give him another spoonful, which is said never to fail. If the roots are dried, they must be moistened with a little water. To the wound may be applied a leaf of good tobacco moistened with rum.

Messrs. Jussieu and Le Sage strongly recommend the use of the volatile fluor alkali as an antidote against the venom of vipers; but if the proofs alleged by the abbé Fontana, that the poison of vipers is not of an acid nature, be admitted, the utility of the alkali must be precluded. The abbé adds, that cantharides, applied outwardly, always did mischief by increasing the inflammation; when given inwardly, they operated as an emetic, which is sometimes beneficial. Scarifications produced the same effects with the external application of cantharides: Peruvian bark, theriaca, oils, the suction of leeches, and of the mouth, were all found ineffectual. He also explodes, in this case, the boasted virtue of the Piedra de Cobras, as an alexipharmic. Quicklime also, when applied to the wound in pigeons, has sometimes been of use, but not so as to justify any confidence in the remedy.

Upon the whole this writer infers, that the greatest security we have against the bite of vipers in one species, is the little probability of its being poisonous to the degree that has been always imagined, and that has caused such dreadful alarms, which alone are sufficient to irritate a tainted habit. He also doubts whether the bite of the rattle-snake is actually so venomous as is generally imagined. See Fontana sur les Poisons et sur le Corps Animal, &c. in 2 vols. 4to. Florence.

Vipers make a considerable article in medicine. Most authors agree, that there is no part, humour, or excrement, not even the gall itself of a viper, but may be swallowed without harm. Accordingly the ancients, and, as several authors assure us, the Indians, as well as many other people at this day, both of the East and West, eat them as we do eels.

Caro viperina, viper's flesh, either roasted or boiled, the physicians have unanimously prescribed as an excellent restorative; and it has been particularly recommended in the elephantiasis, incurable consumptions, leprosy, &c.; and Dr. Mead thinks they might be less sparing in the quantity than they are: instead of a little viper's flesh, he recommends the broth or jelly of vipers; or, as the ancients did, to boil and eat them as fish, or at least to drink vinum viperinum, *i. e.* wine in which they have been long infused.

Viper's flesh, indeed, appears to be very nutritious, and therefore an useful restorative in some kinds of weaknesses and emaciated habits; but in scrophulous, leprous, and other like distempers, the good effects which have been ascribed

ascribed to it are more uncertain. Dr. Lewis says, that he has known a viper taken every day for above a month, in disorders of the leprous kind, without any apparent benefit.

The form in which they are used to the best advantage, is that of broth, or jus viperinum.

Viper's flesh used to be an ingredient in several of our best antidotes, as the theriaca Andromach. &c.

The apothecaries also formerly sold the pulvis viperinus, which is only dried vipers pulverized, heart, liver, and all, and passed through a sieve. This, to heighten the price, we suppose, they call *animal bezoard*.

The salts of vipers, whether volatile or fixed, also their fat, or axungia, and their oil, chemically drawn, are drugs that have been in considerable repute.

The fat of the viper is accounted particularly useful in disorders of the eyes; but what advantages it has above other soft fats, is by no means clear. It was formerly supposed to have some specific power of resisting the poison of the viper's bite, by being rubbed immediately on the wounded part; but experience has now shewn, that common oil is, in this intention, of equal efficacy. Lewis. See COLUBER *Berus*.

VIPER, *Bites and Stings of*, in *Animals*, the affections which it produces in these ways. The bites of such reptiles should constantly be guarded against as much as possible, as they are not unfrequently attended with dangerous consequences. Animals of the neat-cattle kind are more liable to be bitten and stung by these reptiles, than those of any other sort of live-stock. Instances have been known where the tongues of such cattle have even been bitten or stung while grazing or feeding, which have proved fatal. Such stock are, however, seldom attacked by reptiles of the adder kind, except in cases where these are disturbed by the animals in pasturing or feeding; which is the main reason why so many of them are bitten or stung about the head, and occasionally the feet. There are mostly much pain, inflammation, and swelling produced by these bites and stings; the progress of which may commonly be checked or stopped, and the complaint removed, by the use of such means as are directed below.

A sort of soft liquid of the liniment kind may be prepared by mixing strong spirit of hartshorn, saponaceous liniment, spirit of turpentine, and tincture of opium, with olive-oil; the former in the proportion of about two ounces each to three of the last, incorporating them well together by shaking them in a phial, which will be found very useful in many cases. A proper quantity of it should be well rubbed upon the affected part, two or three times in the course of the day, until the inflammation and swelling begin to disappear, after the bottle has been well shaken.

In the more dangerous cases, it may often be advantageous to use fomentations to the affected parts, especially when about the head, with the above application; such as those made by boiling white poppy-heads with the roots of the marshmallow, the leaves of the large plantain, and the tops of wormwood, in the quantities of a few ounces of the first, and a handful of each of the latter, when cut small, and bruised in five or six quarts of the stale grounds of malt liquor. They may be applied frequently to the diseased parts, rubbing them afterwards each time well with the above soft liquid liniment. Where there are feverish appearances, as is often the case in the summer season, a proper quantity of blood may sometimes be taken away with great benefit, and a strong purge be afterwards given of the cooling kind with much use.

In slight cases of this kind, some think the continued free use of spirit of hartshorn, given internally, and applied externally to the affected parts, is the best remedy of any that is yet known.

As they are so dangerous, these reptiles should always be destroyed as much as possible in all pastures and grazing grounds.

VIPER *Wine*, *Vinum Viperinum*, is a preparation of vipers infused in wine. It is commonly made by macerating for a week, with a gentle heat, two ounces of the dried flesh in three pints of mountain. This has been deemed a great restorative, and provocative to venery, and also good against cutaneous eruptions, &c.

But Dr. Lewis observes, that it cannot perhaps be affirmed from fair experience, that this wine has any great virtue.

VIPER'S *Bugloss*, in *Botany*. See ECHIUM.

The flowers of the viper's bugloss are supposed to possess the virtue of cordials, in the same degree with the borage and bugloss. Some authors greatly recommend a decoction of the dried plant in epilepsies. It is said that very singular cures have been done by it.

VIPER'S *Grass*. See SCORZONERA.

The roots of the common viper's grass, or *scorzonera Hispanica* of Linnæus, have been employed indifferently as alexipharmics, and in hypochondriacal disorders and obstructions of the viscera; but at present are more properly considered as alimentary articles, in general salubrious, and moderately nutritious. They abound with a milky juice, of a soft, sweetish taste, but which, in drying, contracts a slight bitterness. Extracts made from them by water are considerably sweet and mucilaginous: extracts made by rectified spirit have a less degree of sweetishness, accompanied with a slight grateful warmth.

In Cartheuser's experiments, the spirituous extract amounted to one-third the weight of the root, and the watery to above one-half. Lewis.

VIPER *Key*, in *Geography*, one of the Tortugas islands.

VIPERA PILEATA, or *Vittata*, in *Zoology*, a name by which some authors have called a remarkable species of Indian serpent, more usually known by the name of *Cobra de capella*.

VIPERARIA, in *Botany*, a name given by some authors to the *scorzonera*, or viper's grass.

VIPITANUM, in *Ancient Geography*, a town of Germany, between Veldidana and Sublavio, thought to be the present Stortzingen, or rather Amoluz, a village at the foot of mount Brenner.

VIPPACH, in *Geography*, a town of Germany, in the territory of Erfurt; 8 miles N. of Erfurt.—Also, a river of Thuringia, which runs into the Gram; 3 miles S. of Sommerda.

VIPPACH, *Marck*, a town of Germany, in the principality of Eisenach; 7 miles N.E. of Erfurt.

VIPULZAN, a town of Austria, in the county of Goritz; 6 miles W. of Goritz.

VIQUE, or VICQ, a town of Spain, in Catalonia; the see of a bishop, suffragan of Tarragona; 22 miles W.S.W. of Gerona. N. lat. 41° 54′. E. long. 2° 8′.

VIR, in *Ancient Geography*, a river of Spain, the mouth of which, according to Ptolemy, is near the promontory on which was the altars of the sun.

VIRABADRA, in *Hindoo Mythology*, a warlike character, usually spoken of as a son of Siva, the *avenging* form of the trimurti, or divine triad of that polytheistic race. (See SIVA and TRIMURTI.) Sometimes he is said to be an incarnation of Siva. He is usually represented four-armed; holding a sword, shield, bow, and arrow; and in a threatening pursuing posture, accompanied by Sivean attributes;

attributes; fuch as collar of fkulls, linga, &c. (See Linga and Saiva.) A human figure with a ram's head, and a handfome female figure, are commonly feen befide him, in the act of adoration. Some account of Virabadra, with reprefentations of him from metallic cafts, may be feen in the Hindoo Pantheon.

Virabadra is a perfonage of extenfive and ancient celebrity. His exploits, parentage, &c. are recorded in the Sivpurana, and his name frequently occurs in other Sanfcrit works. (See Purana.) In the facred poem juft named, it is faid that he was produced from a drop of Siva's fweat. He is underftood, as one of the offspring of Siva, to be included in the denomination of Bhairava; a word derived from *bheru*, meaning terrific or tremendous. It is written, and we believe more correctly pronounced, Vairava; which name is given to another fuppofed fon or incarnation of Siva. See Vairava.

Sonnerat mentions Virabadra as a Carnatic deity; calling him, in his inaccurate mode of writing Eaftern names, Virapatrin. He calls him Siva's fourth fon, produced with a thoufand heads and a thoufand arms, by the fweat of his body, to avert the effects of a facrifice. He is fometimes called alfo Bhir Bhadr.

The other three fons of Siva, mentioned by Sonnerat, are, we fuppofe, *Kartikya*, *Pollear*, and *Vairava*. See thofe articles.

VIRACELLUM, in *Ancient Geography*, a town of Italy, in Liguria, S.E. of Apua.

VIRAGO, a woman of extraordinary ftature and courage, and who, with the female fex, has the mien and air of a man, and performs the actions and exercifes of men.

The word is pure Latin, formed from *vir, man*, and is feldom ufed but in the way of diverfion.

Such were Semiramis and Penthefilea among the ancients; and Jeanne la Pucelle, commonly called *The Maid of Orleans*, among the moderns.

In the Vulgate verfion of the bible, Eve is called *virago*, becaufe made of the rib of man. The Latin tranflator by this, aimed to preferve the etymology as it is in the Hebrew, and of *vir*, formed *virago*; as Adam, in the Hebrew text, called Eve *Ifcha*, of *ifch, man*.

VIRAGUE, in *Geography*, a town of Hindooftan, in Dowlatabad; 25 miles E. of Perinda.

VIRAJ, in *Hindoo Mythology*, a very myfterious perfonification, originating immediately from the godhead, in a manner not reconcileable to minds which have happily fhaken off the trammels of idolatry and fuperftition. In the early portion of the Inftitutes of Menu (ch. i. v. 32.) it is faid, "Having divided his own fubftance, the mighty power became half male, half female (or, fays the commentator, *nature active and paffive*); and from that female he produced Viraj." Menu next tells us that he himfelf was the perfon produced by the *male* power Viraj, and that he produced her lords of created beings eminent in holinefs. Thefe are ufually called Brahmadikas, or offspring of Brahma; but the Puranas do not agree as to their number: fometimes nine, feven, and three only are mentioned. Confiderable difficulty is found in the attempt to reconcile the apparent contradictions in the hiftories of thefe early perfonages; who, it may be reafonably imagined, have had hiftorical exiftence, though fo much obfcured by the fictions of mythology.

All travellers who have vifited the cavern temple, called by the Englifh Elephanta, have been ftruck with a coloffal one-breafted figure; and various have been the conjectures as to its allufion. The author of the Hindoo Pantheon, who has examined the temple in queftion, reafonably judges it to be a reprefentation of Viraj, or nature active and paffive; and he gives feveral reprefentations of fimilar fubjects from original pictures. (See Siva.) In our article Elephanta we have noticed the fuppofition of fome travellers, that the one-breafted armed female alluded to the fable of the Amazons. It is now found that the Hindoos alfo have fables of iflands inhabited only by warlike women, who are called, in the Perfian tranflations of thefe ftories, Hamazen; which word means, in that language, *all-women*. (See on this curious fubject, Moor on Hindoo Infanticide, p. 82.) The whole ground-work of the Amazonian fable may, therefore, have come from India to the embellifhing Greeks, as well as the notion of male and female deities; all originating poffibly in the myfterious fexual union, the fubject of this article.

In the Hindoo mythology, the co-equality of the male and female power is afferted. There is lefs fexual confufion among the Hindoo than among the Greek deities. Among the latter, the fex of feveral is very dubious; while others were both male and female. Authority can be produced among weftern mythologifts, making both Minerva and Venus male as well as female. Thefe goddeffes correfpond with the Parvati and Lakfhmi of the Hindoos: the former of whom is feen in the biune figure Viraj; and the latter in her character of Sukra, or the planet Venus, is of the *male* fex. Soma, the moon of India, is alfo male, as he was among the Germans and Saxons. The Parthians faid that Venus was the moon, and a male deity; as, according to Macrobius, did fome weftern mythologifts. See Soma.

There are fables connected with the hiftory of Krifhna, in which he and his miftreffes, to conceal the fhame of the amorous deity from his enraged confort, were varioufly metamorphofed. On one occafion, as related in a Purana, "when detected dallying in a grove of fandal with Viraja, the figure of a quadruped concealed his fhame; and fhe was changed into a river." This fable is noticed in our article Radha. We know not if the nymph of the fandal grove have any connection with the fubject of this article.

VIRAMSHAMPETTA, in *Geography*, a town of Hindooftan, in the Carnatic; 9 miles S.W. of Terriore.

VIRANDJIK, a town of Afiatic Turkey, in Natolia; 16 miles W. of Kiutaja.

VIRANSHEHR, a town of Afiatic Turkey, in Natolia; 42 miles E.N.E. of Boli.

VIRATARUPA, in *Mythology*, a name of the Hindoo god Vifhnu; and given alfo to his warlike incarnation in the perfon of Rama. See Rama and Vishnu.

VIRBIUS Mons, in *Ancient Geography*, part of a mountain, now called "Mont Albano." The name Vir-bius (from *vir*, man, and *bis*, twice) is faid to have been given to this mountain in honour of Hippolytus, who, having been put to death by a monfter, had been reftored to life by Diana. From the Appian way another was detached, which led to a temple of Diana on this mount. This mountain was on the Appian way, from which diverged two other ways, one of which led to the temple of Jupiter Latialis, on mount Albano, and the other to the temple of Diana, at the bottom of the centre of the lake of Armenia.

VIRE, in *Geography*, a river of France, which rifes near Calvados, and runs into the Englifh Channel, to the north of Ifigny, between the departments of the Channel and the Calvados.—Alfo, a town of France, and principal place of a diftrict, in the department of the Calvados; 27 miles S.W. of Caen. N. lat. 48° 51′. W. long. 48′.

Vire, or *Matraca*, a cape of Arabia, on the coaft of the Indian fea; 16 miles N.N.E. of Haffek.

VIREA, in *Botany*, Adanfon Fam. des Plantes, v. 2. 112,

112, a name which seems to allude to the more green, and less hoary, herbage of the plants to which it is applied, compared with many of the same tribe; like *Vireo*, the Latin name of the Green-finch. See APARGIA, under the article THRINCIA.

VIRECTA, a word derived from *vireo*, to be verdant, alluding to the verdure of the plant, which however is not peculiarly striking, except in the dried specimens; whose colour, being better preserved than in some of the same natural order, might perhaps suggest to Linnæus the idea of the name. *Virectum* occurs in some copies of Virgil, for a green retreat; but *viretum* is generally supposed the true reading.—Linn. Suppl. 17. Schreb. Gen. 125. Willd. Sp. Pl. v. 1. 972. Mart. Mill. Dict. v. 4. Juss. 200. Poiret in Lamarck Dict. v. 8. 676. (Sipanea; Aubl. Guian. 147. t. 56. Juss. 201, under *Mussenda*. Lamarck Illustr. t. 151.)—Class and order, *Pentandria Monogynia*. Nat. Ord. *Stellatæ*, Linn. *Rubiaceæ*, Juss.

Gen. Ch. *Cal.* Perianth superior, of five narrow-awlshaped, erect, equal, permanent leaves, with as many solitary, glandular or bristly, intermediate teeth. *Cor.* of one petal, funnel-shaped; tube thrice as long as the calyx, erect, even; slender below; dilated in the upper half; limb horizontally spreading, in five ovate, or lanceolate, entire, equal segments, not half so long as the tube. *Stam.* Filaments five, various in length, inserted into the middle of the tube; anthers terminal, very long, linear-awlshaped, converging, either contained within the tube, or prominent. *Pist.* Germen inferior, globose, crowned with an elevated rim within the calyx; style thread-shaped, smooth, the length of the tube; stigma in two short, acute, divaricated segments. *Peric.* Capsule globose with five furrows, hispid, crowned with the upright calyx, of two cells and two valves; the partitions transverse, from the centre of each valve. *Recept.* central, globose, meeting the partitions. *Seeds* numerous, small, angular, dotted with minute depressions.

Eff. Ch. Corolla funnel-shaped. Stamens inserted into the tube. Calyx of five leaves, with intermediate teeth. Stigma deeply divided. Capsule inferior, of two cells and two valves, with contrary partitions. Seeds numerous.

Obs. Though Linnæus described this genus with great care and minuteness, he erred in attributing to it a capsule of only one cell. Hence M. Poiret justly doubted the propriety of referring hither the *Sipanea* of Aublet, which has two cells, and if compared with the above description will be found to answer in every material point. The only difference indeed is, that *Sipanea* has five bristles between the *calyx-leaves*, instead of the minute glands of the original *Virecta*. A circumstance which confirms, rather than invalidates, that part of the generic character.

1. V. *biflora*. Twin-flowered Virecta. Linn. Suppl. 134. Syst. Veg. ed. 14. 197. Willd. n. 1. (V. virens; Vahl Symb. v. 2. 38. Rondeletia biflora; Rottb. Surin. 7. t. 2. f. 2.)—Stem creeping. Flower-stalks unequal, terminal, in pairs. Corolla smooth. Stamens within the tube. Leaves ovate, twice as long as their footstalks.—Native of Surinam, in rather moist situations, where it was gathered by Dalberg and Rolander. The *root* is fibrous, annual. *Stems* a foot or more in length, decumbent, throwing out roots from their lower joints, ascending at the extremity, square, a little hairy, leafy, forked. *Leaves* stalked, opposite, near an inch long, smooth, or nearly so, resembling some *Parietariæ*, or *Urticæ*. *Stipulas* small, triangular, opposite, connecting the bases of the footstalks. *Flower-stalks* from the forks of the stem, some of them terminal, each bearing two reddish *flowers*, about an inch long, white in the centre; the lowest of them nearly sessile. *Germen* bristly. *Calyx* and *Corolla* quite smooth.

2. V. *procumbens*. Procumbent Virecta.—Stem procumbent. Flowers terminal, aggregate. Corolla bristly. Stamens prominent. Leaves ovate, thrice as long as their footstalks.—Discovered at Sierra Leone, by Mr. Afzelius, to whom we are obliged for a specimen, and for the determination of the genus. This is about the size of the preceding, but is more procumbent, and rather more hairy, especially the *stem* and *footstalks*. *Leaves* similar, but somewhat smaller, and more tapering from their broad base into the *footstalk*. *Flowers* in some measure capitate, at the end of the stem or branches, not numerous, smaller than the first species; their *corolla* with narrow, almost linear, segments, and clothed externally with shining, bristly hairs. *Filaments* as long as the limb of the *corolla*, with short purplish *anthers*.

3. V. *pratensis*. Savanna Virecta. Vahl Eclog. fasc. 2. 11. Schrad. Journ. v. 2. 333. (Sipanea pratensis; Aubl. Guian. 148. t. 56.)—Stem erect. Flowers terminal, aggregate. Corolla smooth. Stamens within the tube. Leaves ovato-lanceolate, stalked.—Abundant in the meadows round the town of Caïenne, where it is almost always to be found in flower and seed. Aublet says this herb serves to make astringent decoctions, useful for washing wounds and ulcers, as well as in the gonorrhœa. The *root* is fibrous; whether annual or otherwise we are not informed. *Stems* two feet or more in height, roundish, with many opposite *branches*. *Leaves* about an inch and a half long, acute, rather tapering at the base, a little hairy, especially their ribs beneath. *Footstalks* rather short. *Stipulas* membranous, abrupt. *Flowers* five, six, or seven, together, in little terminal tufts, white or rose-coloured, about the size of the first species. The *corolla* appears to be smooth; its segments broad, rounded or obovate. The short *filaments*, inserted into the middle of the tube, with their *anthers* of the same length, are altogether concealed therein, and do not reach near so high as the mouth. *Calyx* fringed with bristles, and furnished with small solitary hairs between its segments; but these do not appear quite so long in Aublet's own specimen as in his figure. The *capsule* resembles *V. biflora*.

4. V. *multiflora*. Many-flowered Virecta.—Stem erect. Flowers terminal, aggregate, numerous. Corolla bristly. Stamens and style longer than the limb. Leaves ovato-lanceolate, nearly sessile.—Found by Mr. Afzelius at Sierra Leone. Very like the last in size and habit, but the *stem* is rather more quadrangular, and purplish. *Leaves* an inch and a half or two inches long, deflexed, rounded at the base, hairy, on short stalks. *Stipulas* lanceolate, hairy. *Flowers* many together, almost sessile, in dense, hairy, terminal heads. *Calyx* densely fringed with long bristly hairs, such as clothe the outside of the *corolla*. The segments of the latter are very narrow, almost linear. The *stamens* extend beyond them, and are quite capillary, smooth, with shortish terminal *anthers*. The *style* is slender, still longer than the *stamens*, with a small divided *stigma*. We have not seen the *fruit*.

VIRELAY, the name of a song among the Provençale poets, which succeeded the *chants royaux*, or royal songs, so called either because Thibaut, compte de Champagne, and king of Navarre, was author of so great a number, or to give them the dignity of poems the most worthy to be sung at court. For different from the Vaudevilles which pass from mouth to mouth, they were produced for the most delicate ears, and performed by the most able musicians of those times. From the chant royal, and from the balade, came the lay and virelay, the rondeau, the triolet, and

and all those little poems, of which the refrein, or burden, is the most agreeable part.

VIRET, Peter, in *Biography*, a famous Calvinistic divine, was born in 1511, at Orbe, in the canton of Berne, and during his studies at Paris formed an acquaintance with Farel, with whom he co-operated in propagating the doctrines of the Reformation in several towns of Switzerland, and particularly at Geneva, whither he accompanied Farel in 1534. At Lausanne he exercised his ministry with great satisfaction, so that he declined the offer of being colleague with Calvin at Geneva. He is said, in one of his visits to Geneva, to have escaped death by poison, administered to him by the instigation of some of the popish canons of that church, which, though it did not prove instantly fatal, injured his constitution, which was delicate, and shortened his life. From Lausanne he removed to Nismes and Montpellier, and at length settled at Lyons. But in 1653 he was obliged to quit his station, in consequence of the edict of Charles IX., which prohibited his subjects of the reformed religion from having ministers that were not born in the kingdom. He then retired to Orange, and from thence, by the invitation of the queen of Navarre, to Berne. In 1569 he was in prison, and exchanged for the governor of a town. His death happened, probably at Pau, in 1571, at the age of 60.

Viret possessed a considerable share of learning, and was an eloquent preacher. His works were numerous; of these, several upon the doctrines and superstition of the Romish church were written in a style of ludicrous sarcasm, but others were serious. His work "On True and False Religion," published at Geneva in 1560, displays much reading on the subject of superstition: but his largest work is "An Exposition of the Doctrine of the Christian Faith," which Dupin depreciates, as he does his small tracts of controversy. Bayle. Dupin.

VIRGA. See Yard.

Virga is particularly used in law for *verge*, or rod, such as sheriffs and bailiffs carry, as a badge of their office.

"Ranf. ap Howell, præpositus de Lantiffin amerciatus pro eo quod habuit in manu sua coram justiciariis hic virgam nigram & inhonestam, ubi habere debuisset virgum album et honestum certæ longitudinis, prout decet." In sess. Itin. de Cardiff. 7 Hen. VI.

Virga *Aurea*, in *Botany*. See Solidago.

Virga *Pastoris*, a name given by some authors to *dipsacus;* which see.

Where the name virga pastoris occurs in the translation of the Arabian writers, it is not to be supposed to mean the plant we call virga pastoris.

It is, indeed, the literal translation of the bassalelrheir of Serapion and Avicenna; but they called the common horse-tail by this name, when they applied the adjective female to it; and when they added the male, they meant by it the common knot-grass.

Virga *Sanguinea*, a name given by Matthiolus, and some other authors, to the cornus fœmina, or dogberry-bush, common in our hedges. See Cornus.

Virgæ *Lateralis Minimus*, in *Anatomy*, a name given by some writers to a muscle, called by others levator ani parvus, and by some transversus ani. It is called by Albinus the transversus perinæi, and by some transversalis penis.

Virgæ, in *Physiology*, a meteor, called also *columellæ*, and *funes tentorii;* being an assemblage of several streams of light, representing a bundle of rods or ropes.

It is supposed owing to the streaming of the sun-beams through certain rimulæ, or chinks; at least through the more lax and open parts of a watery cloud, happening chiefly in the morning and evening.

There is also another kind, consisting not of streams of mere white light, but, as it were, painted of various colours, like those of the rainbow.

VIRGANTIA, in *Ancient Geography*, a town of the Segusians, according to Ammianus Marcellinus. Strabo names it Brigantium: it is so called by Ptolemy and Anton. Itin.: it is the present Briançon.

VIRGAO Alba, a town of Hispania Citerior, called in Anton. Itin. Urcao, Vircao, and Virgao, and marked between Calpurniana and Iliturgis.

VIRGATA Sutura, a term used by some anatomists for the sagittal suture of the cranium.

Virgata *Terræ*, or *Virga Terræ*, a yard-land.

VIRGATORES Servientes, in Fleta, are vergers, or tip-staves, who attend the judges. See Verger, and Serjeant *at Arms*.

VIRGI, or Urca, in *Ancient Geography*, a town of Spain, upon the gulf Virginitanus Sinus.

VIRGIL, Publius Virgilius Maro, in *Biography*, a celebrated Roman poet, whose name is familiar to every classical scholar, was born in the year B.C. 70 at Andes, a village near Mantua, and liberally educated at Cremona, Milan, and Naples. His teacher in philosophy was named Syro, and the philosophy in which he was instructed was the Epicurean. From his first eclogue, in which he is supposed to have related his own adventures under the appellation of Tityrus, it appears that he first visited Rome in his 30th year for the purpose of recovering lands that were in the possession of the military belonging to Octavius and Antony, after the war against the republicans; and having been introduced to Octavius by Pollio, or some other person, and to his subsequent patron Mecænas, he succeeded in the object of his visit by their influence. His life, however, was endangered by the violence of the veteran who occupied his farm, and who resisted the surrender of it, so that he was obliged to seek redress by another visit to Rome, and to obtain an order for his reinstatement. His eclogues, which were completed in his 33d or 34th year, were very favourably received; and in his 34th year he was induced by Mecænas to commence his Georgics; and during a period of seven years, which he employed in the prosecution of them, he resided chiefly at Naples. The latter years of his life were devoted to the Æneid. At this time he was ranked among those friends, who were particularly distinguished by the attention and confidence of Augustus. After the death of Marcellus, in the year B. C. 23, he paid that admirable tribute to his memory, which occurs in the sixth book of the Æneid, and concerning which Donatus says, that when it was recited before Augustus, in the presence of Octavia, the mother of the deceased, as soon as the words "Tu Marcellus eris" were pronounced, she fainted away; and afterwards rewarded the poet with ten sesterces (above 80*l.*) for each line of the passage. After the completion of his Æneid, Virgil went to Greece, with the view of further polishing it; and on this occasion Horace is supposed to have addressed him with the third ode of his first book, beginning "Sic, te Diva potens Cypri," in which he expresses the warmest affection for his brother poet. At Athens he met with Augustus, and proposed returning in his company; but at Megara he was seized with a disorder, which detained him, as some say, at Brundusium, or, according to others, at Tarentum, and which soon terminated his life in the year B.C. 19, in the 52d year of his age. His remains were conveyed, in pursuance of his request, to Naples, and interred

terred on the Puteolan way. On his death-bed he is faid to have expreffed a wifh that his Æneid, which he regarded as an imperfect work, might be committed to the flames; but it was faved either by the interpofition of his friends Tucca and Varus, who prevailed upon him to bequeath it to them, on the condition that they fhould make no alteration in it, or by the injunctions of Auguftus to his executors. His modefty, indicated by this wifh, was combined with other fimilar qualities. "He was mild and gentle in his manners, unaffuming in converfation, fincere and faithful in friendfhip, fo that he was fingularly beloved by Auguftus, Mecænas, and all the moft diftinguifhed perfons of that period." His poetical talents, as well as general character, were highly appreciated by his contemporaries, infomuch that whenfoever his verfes were recited in the theatre whilft he was prefent, the audience rofe up and paid him the refpect which was ufually manifefted to the emperor. His eminent merit has been alfo acknowledged by ancient and modern critics, and though they have differed in opinion as to his peculiar and diftinguifhing excellencies, they have generally agreed, as one of his moft judicious biographers has faid, "in placing him upon one of the higheft feats in Parnaffus." Of the faculty of invention he feems to have poffeffed a very moderate fhare, infomuch that his Bucolics, Georgics, and Æneid, abound with traces of imitation, and even of tranflation; but it is "in the diction and phrafeology of poetry, in all that conftitutes the artift, that his chief excellence confifts; and his admirers will not allow that the Virgilian fplendour and majefty of ftyle have ever been equalled."—"In two fpecies of compofition Virgil has afforded models to almoft all fucceeding poets, the didactic and the epic." His fame has been teftified by the numerous editions of his works, as well as the commentaries and tranflations which they have produced. The learned profeffor Heyne has given an account of the various MSS. and editions of Virgil in his edition of Leipfic, 1788, which has been confidered by competent judges as the moft complete and valuable. For a defcription and character of the Æneid, fee ÆNEID. Vita Virgilii Ruæi et Heynii. Gen. Biog.

VIRGIL, in *Geography*, a poft-townfhip of America, in the province of New York, and S.W. corner of Courtlandt county; 10 miles S. of Homer, and 155 miles W. of Albany. It is ten miles fquare, well watered, and furnifhed with good roads; the foil is excellent; the timber is maple, beech, bafs, elm, butter-nut, &c. with fome pine and hemlock. In 1810, the population was 913; the fenatorial electors 77; and the whole amount of taxable property 84,351 dollars.

VIRGILIA, in *Botany*, a genus dedicated by Lamarck to the great Latin poet, whofe Georgics may well claim for him this fort of commemoration, has taken place of the *Virgilia* of L'Heritier, Sm. Exot. Bot. v. 1. 71, called by Lamarck and others *Galardia*. We fhall fubmit to the general determination; for though L'Heritier thought M. Gaillard unworthy of diftinction, he may be fcreened by a hoft of names, which certainly confer lefs honour upon their authors than their owners, however fmall the merits of the latter may be.—Lamarck Illuftr. t. 326. Poiret in Lamarck Dict. v. 8. 677. Brown in Ait. Hort. Kew. v. 3. 4. Purfh 309.—Clafs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminofæ*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-fhaped, two-lipped; upper lip in two lefs deeply feparated fegments; lower in three fpreading ones; the tube breaking off circularly juft above the bafe. *Cor.* papilionaceous; ftandard oval, afcending, not reflexed at the fides, emarginate: wings oblong, direct, rather fhorter than the ftandard; keel of two elliptic-oblong petals, nearly the length of the wings. *Stam.* Filaments ten, awl-fhaped, diftinct, afcending, converging, the length of the keel which enfolds them; anthers oval, notched. *Pift.* Germen fuperior, oblong, compreffed; ftyle curved, the length of the ftamens; ftigma obtufe, beardlefs. *Peric.* Legume oblong, compreffed, of one cell and two valves. *Seeds* feveral, orbicular, compreffed.

Eff. Ch. Calyx two-lipped, with five unequal teeth. Corolla papilionaceous, nearly equal; ftandard not reflexed at the fides. Stigma beardlefs. Legume compreffed, oblong, with many feeds.

1. V. *capenfis*. Vetch-leaved Virgilia. Poiret in Lam. n. 1. Lam. fig. 2. Ait. n. 3. (Podalyria capenfis; Willd. Sp. Pl. v. 2. 501. Sophora capenfis; Linn. Mant. 67. Thunb. Prodr. 79. Andr. Repof. t. 347. S. oroboides; Berg. Cap. 142.)—Stamens deciduous; woolly at the bafe. Germen downy. Keel acute. Leaflets lanceolate, downy beneath. Legume filky.—Native of the Cape of Good Hope. The late Thomas Cornwall, efq. an affiduous cultivator of exotic plants, is faid by Mr. Aiton to have firft introduced this fpecies in 1767. The feeds have often been imported fince the plant, being frequent near Cape Town. It flowers with us in July and Auguft, being fheltered in winter in the greenhoufe. This is a tall fhrub, or fmall tree, having alternate pinnate *leaves*, with an odd leaflet, like the whole genus. The *leaflets* are very numerous, uniform, about an inch long, acute; fhining, and nearly fmooth, on the upper fide. *Flowers* in ftalked, axillary, downy clufters, fhorter than the leaves, each half the fize of a common Sweet-pea, white, with a pink, lunate fpot on the *ftandard*. *Legume* downy, two inches long.

2. V. *aurea*. Great-flowered Virgilia. Poir. in Lam. n. 2. Lam. fig. 1. Ait. n. 1. (Podalyria aurea; Willd. Sp. Pl. v. 2. 502. Robinia fubdecandra; L'Herit. Stirp. Nov. 157. t. 75.)—Stamens permanent. Germen downy. Leaflets elliptical, obtufe, pointlefs. Legume fmooth.—Native of Abyffinia. Sent to Kew in 1777, by M. Thouin. A greenhoufe fhrub, flowering in July. The *leaflets* are full as numerous as in the foregoing, and longer, more elliptical and obtufe, fmooth on both fides; paler, and a little glaucous, at the back. *Flowers* yellow, according to L'Heritier; Poiret fays white; the fize of the former, in axillary clufters as long as the leaves. *Legume* two or three inches long, quite fmooth.

3. V. *intrufa*. Small-flowered Virgilia. Br. in Ait. n. 2. —"Stamens permanent. Germen fmooth. Calyx concave externally at the bafe. Leaflets oval, obtufe, with a fmall point."—Native of the Cape of Good Hope, from whence it was fent to Kew garden, by Mr. Maffon, about the year 1790. A greenhoufe fhrub, flowering moft part of the fummer. *Aiton.*

4. V. *fecundiflora*. Unilateral-flowered Virgilia. Cavan. Ic. v. 5. 1. t. 401. Poir. in Lam. n. 3. ("Brouffonetia fecundiflora; Ortega Dec. 5. 61. t. 7.")—Germen and legume downy. Calyx tapering at the bafe. Leaflets oval, obtufe, pointlefs.—Native of New Spain. It flowered at Madrid in April. We have a fpecimen from Cavanilles, but the plant has not yet found its way into the Englifh greenhoufes. The *ftem* is fhrubby, three feet or more in height, with ftout, round, finely downy *branches*. *Leaflets* rather fewer than in any of the reft, coriaceous, veiny, fmooth or very flightly filky, an inch long, feffile, moftly alternate, on a channelled common ftalk. *Clufter* terminal, denfe, of numerous *flowers* all turned one way, fcarcely fo

large

large as in the first or second species. *Calyx* finely silky, with shallow divisions. *Petals* blue; the *standard* much paler than the rest. *Stamens* smooth. *Germen* very silky.

5. V. *lutea*. Yellow American Virgilia. Pursh n. 1.—"Leaflets alternate, ovate, short-pointed, smooth. Clusters elongated, pendulous. Legumes stalked, flat."—On mountains between Georgia and Tennassee. A handsome tree, much like our Laburnum, flowering in June. The bark gives a beautiful yellow dye. *Pursh.*

VIRGILIAN Husbandry. See Husbandry.

VIRGILIANÆ Sortes. See Sortes.

VIRGIN, Virgo, a female who has had no carnal commerce with a man; or, more properly, who has still the *flos virginis*, or maidenhood.

By the Mosaic law, the priests are enjoined to take none to wife but those that are virgins; the widow, the divorced, and the harlot, are to be refrained from.

In the Roman breviary there is a particular office for virgins departed, answering to those of saints, martyrs, and confessors.

Virgin is also applied, by way of eminence, to Mary the mother of our Saviour.

Many of the fathers, with the modern churches, hold, that the Virgin not only conceived, but brought forth, or was delivered without breach of her virginity; otherwise, saith St. Augustine, it would be false which is said in the creed, that he was born of a virgin. It is even alleged that she still remained a virgin to the end of her life; whence the Greeks always called her αει παρθενος, *ever Virgin Mary*; and after them the Latins, *semper virgo*. Though, as this is not recorded in Holy Writ, many have denied it, and held that she had afterwards to do with Joseph, and bore other children; and this as early as the time of Origen. Tertullian himself is produced as one that denied the perpetual virginity; and the like may be said of Apollinaris and Eunomius, with their followers. See Antidicomarianites and Helvidians.

Virgin, *Charity of the Holy*. See Charity.

Virgin, *Nativity of the*. See Nativity.

Virgin, *Presentation of the*. See Presentation.

Virgins *of Love*. See Mission.

Virgin is also applied, figuratively, to several things that retain their absolute purity, and have never been made use of. Thus,

Virgin *Copper*. See Copper.

Virgin *Gold*. See Gold.

Virgin *Oil*. See *Virgin* Oil.

Virgin *Parchment*. See Parchment.

Virgin *Quicksilver*, is that found perfectly formed, and fluid in the veins of mines; or at least such as is got from the mineral earth, by mere lotion, without fire.

Virgin *Sulphur*. See Sulphur.

Virgin *Wax*. See *Virgin* Wax.

Virgin's *Bower*, in *Botany*. See Clematis.

The leaves and flowers of the upright virgin's bower, or *clematis erecta* of Linnæus, called also *flammula Jovis*, and distinguished by its pinnated oval leaves and erect stalk, are extremely acrid; the former, when fresh, raising blisters on the part to which they are applied.

This is one of the new medicines introduced by Dr. Stoerck. He has published several cases of its efficacy in cancerous, venereal, and other malignant ulcers, obstinate pains of the head and bones, inveterate itch, and other diseases proceeding from peculiar acrimony. It was used internally, in infusion of the flowers or leaves, and extract of the plants; and the powder was sprinkled on the ulcers externally, where it was found to act as a most excellent escharotic and detergent.

The medicine is said to have proved diuretic to some patients, and sudorific to others, but rarely to have moved the belly. Small doses, of only half a grain of the extract, and half a drachm of the dried leaves in infusion, were at first exhibited, which were gradually increased. Lewis.

Virgin's *Milk*, in the *Materia Medica*, is a name given to a solution of benzoin in spirits, mixed with twenty times its quantity, or more, of water, which renders it milky.

It is said to be of great service in disorders of the breast, for resolving obstructions of the pulmonary vessels, and promoting expectoration. It is also used as a cosmetic.

Virgin's *Milk*. See *Virgin's* Milk.

Virgin's *Thread*, a sort of meteor that flies in the air, like small untwisted silk, and which falling upon the ground, or open plants, changes itself into a substance like a spider's web.

In these northern climates it is most frequent in summer; the days being then temperately warm, the earth not exceeding dry, nor yet overcharged with moisture.

This has formerly passed for a sort of dew of an earthy slimy nature; but naturalists are now agreed, that the virgin's threads are no other than so many spiders' webs.

Virgin, *Cape*, in *Geography*, a cape on the S.E. coast of South America, at the entrance into the Straits of Magellan. It was so called by Magellan, because he discovered it on the feast of St. Ursula. S. lat. 52° 24'. W. long. 67° 52'.

Virgin *Islands*, a group of islands in the West Indies, E. of Porto Rico, extending 60 miles in length and upwards of 36 in breadth; dangerous to navigators, though in the midst of them there is a basin, 18 or 20 miles long, and 9 or 12 broad, in which ships may anchor and be sheltered from all winds, called the "Bay of Sir Francis Drake," from his having passed through them to St. Domingo. Some have erroneously supposed that the name was bestowed upon them, in 1580, by sir Francis Drake, in honour of queen Elizabeth; but the fact is, that these islands were named "Las Virgines" by Columbus himself, who discovered them in 1493, and gave them this appellation, in allusion to the well-known legend in the Romish church of the 11,000 virgins. After having been long neglected by the Spaniards, they were visited in 1596 by the earl of Cumberland, in his way to Porto Rico; and the historian of that voyage describes them as "a haunt of little islands, wholly uninhabited, sandy, barren, and craggy." The whole group comprehends about 40 islands, islets, and keys, and they are at present divided between the English, the Spaniards, and Danes. The English hold Tortola, and Virgin-Gorda, called Penniston, and corruptly Spanish-Town, in which are two very good harbours; Josvan Dykes, Guana isle, Beef and Thatch islands, Anegada, Nicker, Prickly Pear, Camane's, Ginger, Cooper's, Salt island, Peter's island, and several others of little value. The Danes possess Santa Cruz, or *Sta. Croix* (which see), St. Thomas, with about twelve smaller dependent islands, and St. John, having the best harbour of any island to the leeward of Antigua: and the Spaniards claim Crab island, the Green or Serpent island, the Tropic Keys, and Great and Little Passage. Those islands which now belong to the British government were first possessed by a party of Dutch Buccaneers, who fixed themselves at *Tortola* (which see), and the English title has remained. The colony struggled with difficulties until the year 1773; when a petition was presented to his majesty, requesting that the governor and council might be permitted to frame proper laws for their government and welfare; pledging themselves, in such case, to grant to his majesty, his heirs and successors, an impost of 4½ *per cent.*, in specie, upon all commodities the growth of these islands, similar to that which was

was paid in the other Leeward iſlands. This application ſucceeded; and an aſſembly was convened Feb. 1. 1774, which honourably complied with their engagement to the crown. They afterwards paſſed a grant of 400*l.* currency *per annum*, as their proportion towards the ſalary of the governor-general. Such was the price at which the Virgin iſlands purchaſed the eſtabliſhment of a conſtitutional legiſlature. The chief and almoſt the only ſtaple productions of theſe iſlands are ſugar and cotton. Theſe iſlands lie in about N. lat. 18° 20′; and the paſſage through them is ſafe, at W. by N. and W.N.W. as far as to the W. end of the fourth iſland. Edwards's Hiſt. of the Weſt Indies, vol. i.

VIRGIN *Rocks*, rocks in the Atlantic, 60 miles S.E. of Cape Race, on the coaſt of Newfoundland. N. lat. 46° 20′. W. long. 50°.

VIRGINAL, is a keyed muſical inſtrument of one ſtring, jack, and quill to each note, like a ſpinet; but in ſhape reſembling the preſent ſmall piano-forte. It has been imagined to have been invented in England during the reign of queen Elizabeth, and to have been thus denominated in honour of that virgin princeſs; but we have here not only a proof of its uſe in this kingdom before ſhe was queen, but a drawing and deſcription of it appeared in Luſcinius's Muſurgia, before ſhe was born. Dr. Johnſon imagines that this inſtrument had its name from being chiefly cultivated by young ladies.

VIRGINAL-*Book of Queen Elizabeth.* See QUEEN *Elizabeth*, and BIRD.

VIRGINAL-*Book of Lady Nevil.* See BIRD.

For the firſt muſic that was printed for the virginal, ſee PARTHENIA.

VIRGINALE CLAUSTRUM, in *Anatomy*, the ſame as hymen.

VIRGINES, LAS, *Bay of*, in *Geography*, a bay on the coaſt of New Albion, between Cape Colne and Point Zuniga.

VIRGINEUS MORBUS, the *Virgin's diſeaſe*; the green-ſickneſs, or chloroſis.

VIRGIN-GORDA, in *Geography*. See SPANISH-*Town*.

VIRGINIA, one of the United States of America, ſituated between 36° 30′ and 40° 43′ N. lat., and 1° 40′ E. and 6° 20′ W. long. from Waſhington; and bounded on the N. by Maryland, Pennſylvania, and Ohio; on the S. by North Carolina and Tenneſſee; on the E. by Maryland and the Atlantic ocean; and on the W. by Kentucky and Ohio. Its extent from N. to S. is 220 miles, and from E. to W. 370 miles; and its area about 64,000 ſquare miles, or 40,960,000 acres. The number of inhabitants, deduced from the cenſus of 1810, and ſtated by Mr. Meliſh, is 974,622, as in the following

Topographical Table.

Counties.	No. of Inhabitants.	Chief Towns.	
Accomack	15,743	Drummond.	
Albemarle	18,268	Charlotteſville.	
Amelia	10,594		
Amherſt	10,548	New Glaſgow.	
Auguſta	14,308	Staunton.	
Bath	4,837	Warm Springs.	
Bedford	16,148	Liberty.	
Berkley	11,479	Martinſburg.	
Botetourt	13,301	Fincaſtle	700
Brooke	5,843	Charleſtown.	
Brunſwick	15,411		
Buckingham	20,059	New Canton.	
Campbell	11,001	Lynchburg.	
Caroline	17,544	Port Royal	1500
Charles City	5,186		
Charlotte	13,161	Maryſville.	
Cheſterfield	9,979	Mancheſter.	
Cumberland	9,992	Carterſville.	
Culpeper	18,967	Fairfax.	
Cabell	2,717		
Dinwiddie	12,524	Peterſburgh	5668
Elizabeth City	3,608	Hampton.	
Eſſex	9,376	Tappahannock	600
Faquier	22,689	Warrentown.	
Fairfax	13,111	Centreville.	
Fluvanna	4,775	Columbia.	
Frederick	22,574	Wincheſter	2500
Franklin	10,724	Rocky Mount.	
Glouceſter	10,427		
Goochland	10,203		
Grayſon	4,941	Greenſville.	
Greenbriar	5,914	Lewiſburg.	
Greenſville	6,858	Hicksford.	
Giles	3,745		
Halifax	22,133	South Boſton.	
Hampſhire	9,784	Romney.	
Hanover	15,082	Hanover.	
Hardy	5,525	Moorfields.	
Harriſon	9,958	Clarkeſburg.	
Henrico	9,945	Richmond	9735
Henry	5,611	Martinſville.	
Iſle of Wight	9,186	Smithfield.	
James City	9,094	Williamſburg	1500
Jefferſon	11,851	Charles Town.	
Kanhaway	3,866	Charles Town.	
King and Queen	10,988	Dunkirk.	
King George	6,454		
King William	9,285	Delaware.	
Lancaſter	5,592	Kilmarnock.	
Lee	4,694	Joneſville.	
Loudon	21,338	Leeſburgh	400
Louiſa	11,900		
Lunenburg	12,265	Hungary.	
Madiſon	8,381	Madiſon.	
Matthews	4,227		
Mecklinburg	18,453	St. Tammany.	
Middleſex	4,414	Urbanna.	
Monongalia	12,793	Morgan Town.	
Monroe	5,444	Union Town.	
Montgomery	8,409	Chriſtianſburg.	
Maſon	1,991	Point Pleaſant.	
Nanſemond	10,324	Suffolk	350
New Kent	6,478	Cumberland.	
Norfolk County	13,679	Norfolk	9193
Northampton	7,474		
Northumberland	8,308	Bridge Town.	
Nottaway	9,278		
Nelſon	9,684		
Ohio	8,175	Wheeling.	
Orange	12,323	Stannardſville.	
Patrick	4,695		
Pendleton	4,239	Franklin.	
Pittſylvania	17,172	Danville.	
Powhatan	8,073		
Prince Edward	12,409	James Town.	
Princeſs Anne	9,498	Kempſville.	
Prince William	11,311	Haymarket.	
Prince George	8,050		
Randolph	2,854	Beverley.	
Richmond	6,214		
Rockbridge	10,318	Lexington	400

Rocking-

Counties.	No. of Inhabitants.	Chief Towns.	
Rockingham	12,753		
Ruffell	6,316	Franklin.	
Shenandoah	13,646	Woodftock.	
Southampton	13,497	Jerufalem.	
Spotfylvania	13,296	Fredericksburg	1500
Stafford	9,830	Falmouth.	
Surry	6,855	Cobham.	
Suffex	11,362		
Tazewell	3,007	Jeffersonville.	
Tyler*			
Warwick	1,835		
Wafhington	12,136	Abingdon.	
Weftmoreland	8,102	Leeds.	
Wood	3,036	Newport.	
Wythe	8,356	Evanfham.	
York	5,187	York	700
City of Richmond	9,735		
Norfolk Borough	9,193		
Peterfburgh	5,668		

* Laid out fince laft cenfus.

The afpect of the country is different in various parts of it. On the eaftern fhore it is level, interfperfed with fwamps and meadows. In the middle it is mountainous, with many rich valleys, and on the weft fide hilly. With regard to the *mountains*, it is obferved, that they are not folitary, and fcattered confufedly over the face of the country; but they commence at about 150 miles from the fea-coaft, and are difpofed in ridges one behind another, running nearly parallel to the fea-coaft, but rather approaching as they advance towards the N.E. To the S.W. the mountains converge into a fingle ridge, which as it approaches the gulf of Mexico fubfides into plain country, and gives rife to fome of the waters of that gulf, and particularly to a river called Apalachicola. Hence the mountains were denominated the Apalachian mountains, being in reality the termination only of the great ridges paffing through the continent. The name, however, has been extended by European geographers; fome giving it, after their feparation into different ridges, to the Blue Ridge, others to the North mountains, others to the Alleghany, and others to the Laurel Ridge. The veins of lime-ftone, coal, and other minerals, lie generally in the fame direction. But the courfes of the great rivers are at right angles with thefe. James and Potomac penetrate through all the ridges of mountains E. of the *Alleghany* (which fee), which is broken by no water-courfe, but is in reality the fpine of the country, between the Atlantic on one fide, and the Miffifippi and St. Laurence on the other. The paffage of the Potomac through the Blue Ridge exhibits one of the moft ftupendous fcenes in nature. The only remarkable cafcade in this country, is that of the Falling Spring in the county of Augufta, formed by a water of James river, here called Jackfon's river; but it bears no comparifon with that of Niagara. In the lime-ftone country, there are feveral extenfive *caverns*; the moft noted of which is called Madifon's cave, on the N. fide of the Blue Ridge. It extends into the earth about 300 feet, and branches into fubordinate caverns. There are alfo fome others, fuch as that near the North mountain, in the county of Frederick, and the Blowing cave, in the ridge which divides the waters of the Cow and Calf pafture; befides another of the fame kind with this laft in Cumberland mountain. But of all nature's works, the moft fublime is the Natural Bridge; lying on the afcent of a hill which feems to have been cloven through its whole length by fome great convulfion. The fiffure juft at the bridge is reckoned to be 270 feet deep, about 45 wide at the bottom, and 90 at the top, which is of courfe the length of the bridge, and its height above the water. Its breadth in the middle is about 60 feet, and the thicknefs of the mafs at the fummit of the arch about 40 feet. This bridge is in the county of Rockbridge. The ftream paffing under it is called Cedar creek, which is a water of James river.

The *minerals* of this ftate are iron, coal, lime-ftone, and fome copper, black-lead, and gold. The ore from which gold was extracted was found on the N. fide of Rappahannock, about four miles below the Falls. On the Great Kanhaway, in the county of Montgomery, are mines of lead; the ore containing a fmall portion of filver not worth the pains of feparation. A valuable lead-mine is alfo faid to have been difcovered in Cumberland, below the mouth of Red river. A mine of copper was once opened in the county of Amherft, but the difcovery was not profecuted. There are feveral mines of iron, particularly two in the valley between the Blue Ridge and the North mountain. Confiderable quantities of black-lead are taken occafionally for ufe from Winterham, in the county of Amelia. Mineral coal of a very excellent quality is abundantly fupplied by the country on James river, from fifteen to twenty miles above Richmond, and for feveral miles northward and fouthward; alfo by the weftern country in fo many places, that the whole tract between the Laurel mountain, Miffifippi, and the Ohio, has been fuppofed to yield coal. On James river, at the mouth of Rockfifh, there is great abundance of good marble. There is known only one vein of lime-ftone below the Blue Ridge; from the Blue Ridge weftwardly, the whole country feems to be founded on a rock of lime-ftone, which is cut into beds, and range, like the mountains and fea-coaft, from S.W. to N.E., the lamina of each bed declining from the horizon towards a parallelifm with the axis of the earth. Near the weftern foot of the North mountain are immenfe bodies of fchift, which contain impreffions of fhells in a variety of forms.

Mineral fprings are numerous; but the moft efficacious of thefe are two in Augufta, near the firft fources of James river, where it is called Jackfon's river. One is called the Warm fpring, the other the Hot fpring. The fweet fprings are in the county of Botetourt, at the eaftern foot of the Alleghany, about forty-two miles from the warm fprings. On Potomac river, in Berkley county, above the North mountain, are medicinal fprings that are much more frequented than thofe of Augufta. At Richmond there is a weak chalybeate; and it is faid that there are fulphur fprings, one on Howard's creek of Greenbriar, and another at Boonfborough, on Kentucky. There is alfo in the low grounds of the Great Kanhaway, feven miles above the mouth of Elk river, and fixty-feven above that of the Kanhaway itfelf, a hole in the earth, capable of holding thirty or forty gallons, from which iffues a gas or bituminous vapour in fo ftrong a current, as to caufe the fand about its orifice to exhibit the motion which it has in a boiling fpring; and on prefenting a candle or lighted torch to it, it flames up in a column of eighteen inches in diameter, and four or five feet in height, and burns for feveral days: there is another fimilar to it on Sandy river, with a column of flame twelve inches in diameter, and three feet high. In this country there are alfo feveral fyphon fountains.

The *rivers* of Virginia are the Potomac or Potowmack, Shenandoah, Rappahannock, Mattapony, Pamunky, York, James, Rivannah, Appomattox, Elizabeth, Nottaway, Meherrin, Staunton, Ohio, Sandy, Great Kanhaway, Little Kanhaway, Monongahela, and Cheat. Several of thefe

these are navigable for vessels of various sizes, and to considerable distances. The principal of them are separately noticed under their respective names.

The *soil* in the low part of the state is sandy, but rich on the banks of rivers: between the head of tide-waters and the mountains it is pretty good. The mountains are poor, and in various places incapable of culture, but they are interspersed with many fertile valleys. West of the mountains the soil is generally good.

Of the *produce* of this state, wheat and tobacco are the staples; corn, rye, barley, buckwheat, hemp, flax, roots, grass, fruit, indigo, and some silk, are also cultivated.

As to the *climate*, in the low country, the summers are hot, and winters mild; in the upper country, and among the mountains, the air is pure, and the weather pleasant: towards the west, temperate.

With respect to the state of *literature* in Virginia, the college of William and Mary is the only public seminary of learning. (See College.) Besides this, it has a number of flourishing academies; one in Prince Edward county, one at Alexandria, one at Norfolk, one at Hanover, and others at other places. Since the declaration of independence, the laws have been revised, and one object in this revisal was the diffusion of knowledge more generally through the mass of the people. The bill for this purpose proposed to lay off every county into small districts of five or six miles square, called hundreds, and in each of them to establish a school for instruction in reading, writing, and arithmetic.

As to the *religion* of Virginia, we may observe, that the first settlers were emigrants from England, belonging to the English church; and though they were flying from persecution, they manifested a considerable degree of intolerance: which was also the case with their Presbyterian brethren, who had emigrated to the northern government; and the Quakers, who were seeking an asylum from persecution, experienced the effects of this intolerance. At the commencement of the late revolution, two-thirds of the people are said to have become dissenters of one description or another. The present denominations of Christians in Virginia are, Presbyterians, who are the most numerous, and inhabit the western parts of the state; Episcopalians, or, as Mr. Jefferson calls them, "Anglicans," who are the most ancient settlers, and occupy the eastern and first settled parts of the state; and intermingled with these, Baptists and Methodists in great numbers.

With regard to the *character* of the Virginians, it is observed, that as a political and military body, they rank among the first in the page of history; some of them having been most active in effecting the revolutions in America, and influencing the great mass of the people, who would otherwise have indulged their indolence and indifference. Valuing themselves on their inheriting the ancient dominion, they have thought themselves entitled to the first rank in the union, and without doubt they have reason to boast of their "Washington." But Virginia, though claiming priority of the northern states in point of age, is far from being equal to some of them as to literary, mechanical, nautical, agricultural, and manufactural improvements. Allowing for some few instances, the Virginians have made very little progress in the arts and sciences. Before the revolution they were represented by travellers who passed through their country as indolent and inactive, fond of society, addicted to convivial pleasures, and of course indisposed for any enterprise that exposed them to fatigue and danger. The authority which they exercised over their slaves rendered them vain and imperious, and strangers to that elegance of sentiment which is peculiarly characteristic of refined and polished nations. Hence they were led to extravagance, ostentation, a disregard of economy, and inattention to business: they were haughty and jealous of their liberties, impatient of restraint, and averse from being controuled by any superior power. They are, however, liberal and generous; and are ready to furnish necessary supplies for the support of government, as well as for the purposes of hospitality. Their women are, upon the whole, handsome, though in this respect inferior to those of England: having few advantages, their accomplishments are inconsiderable, and their temper reserved. The only amusement to which they are much addicted is dancing, and it is almost the only one of which they participate. The Virginians, says a discerning traveller cited by Morse, are rich, and in general sensible, polite, and hospitable, and of an independent spirit: the poor are ignorant and abject: but all are of an inquisitive turn, and in many other respects very much resemble the people in the eastern states. They differ from them, however, in their morals: the former being much addicted to gaming, drinking, swearing, horse-racing, cock-fighting, and most kinds of dissipation. There is a much greater difference between the rich and poor in Virginia than in any of the northern states.

As to the *constitution*, and *judiciary administration* of Virginia, we observe, that the executive powers are lodged in the hands of a governor, annually chosen, and incapable of acting more than three years in seven. He is assisted by a council of eight members. The judiciary powers are divided among several courts. Legislation is exercised by two houses of assembly; the one called the house of delegates, composed of two members from each county, chosen annually by the citizens possessing an estate for life in 100 acres of uninhabited land, or 25 acres with a house upon it, or in a house or lot in some town: the other called the senate, consisting of twenty-four members, chosen quadriennially by the same electors, who for this purpose are distributed into twenty-four districts. The concurrence of both houses is necessary for passing a law. There are three superior courts, to which appeals lie from the courts below; *viz.* the high court of chancery, the general court, and the court of admiralty. There is one supreme court, called the court of appeals, composed of the judges of the three superior courts, assembling twice a year, at stated times, at Richmond. It receives appeals in all civil cases from each of the superior courts, and finally determines them; but has no original jurisdiction. In 1785, the assembly enacted that no man should be compelled to support any religious worship, place, or minister whatsoever, nor be enforced, restrained, molested, or burdened in his body or goods, nor otherwise suffer on account of his religious opinions or belief; but that all men should be free to profess, and by argument to maintain, their opinions in matters of religion; and that the same should in no wise diminish, enlarge, or affect their civil capacities. In October 1786, an act was passed by the assembly, prohibiting the importation of slaves into the commonwealth, upon penalty of the forfeiture of the sum of 1000*l.* for every slave. And every slave imported contrary to the true intent and meaning of this act, becomes free.

History of Virginia.—In the year 1584, two patents were granted by queen Elizabeth, one to Adrian Gilbert (Feb. 6), the other to sir Walter Raleigh (March 25), for lands not possessed by any Christian prince. Under the direction of sir Walter, two ships were sent out, and in July, 1585, arrived on the coast, anchoring in a harbour seven leagues W. of the Roanoke. On the 15th of July they took formal possession of the country, and in honour of their virgin queen Elizabeth, called it Virginia. Before this event the country was known

known by the general name of Florida; afterwards Virginia became the common name for the whole of North America. In 1586, a colony of more than one hundred people was stationed at Roanoke, under the direction of captain Ralph Lane; which colony endured extreme hardships, and must have perished, if sir Francis Drake had not fortunately returned to Virginia, and carried them to England. In 1587, sir Walter sent another company to Virginia, under governor White, with a charter and twelve assistants; and in July this colony arrived at Roanoke, where 115 people were left at the old settlement. In 1590, governor White came over again to Virginia, with supplies and recruits for his colony; but not a man was to be found, all having perished either by famine, or massacred by the Indians. Some further unsuccessful attempts were made for settling this province. At length, in 1606, James I., by patent, divided Virginia into two colonies. The first, under the name of South Virginia, was granted to the London company; the northern, called the second colony, and known by the general name of North Virginia, was granted to the Plymouth company; and each of these colonies had a council of thirteen men to govern them. The Plymouth colony broke up, after enduring many hardships, in 1608. In 1610, the South Virginia or London company sealed a patent to lord De la War, or Delaware, constituting him governor and captain-general of South Virginia, and he soon after embarked for America with 150 men, in three ships. From this time we may date the effectual settlement of Virginia. By a marriage in April, 1613, of Mr. John Rolfe, a worthy young gentleman, with Pocahontas, the daughter of Powhatan, a famous Indian chief, the connection, equally agreeable to the English and the Indians, laid the foundation of a friendly and advantageous commerce between them. The descendants of Pocahontas became the heads of some of the most respectable families in Virginia. Her brother-in-law, Tomocomo, accompanied her to England, and on his return, being asked by Powhatan how many people there were in England, replied, "count the stars in the sky, the leaves on the trees, and the sands on the sea-shore; for such is the number of the people in England." The government of Virginia was settled in consequence of a charter obtained in 1609, on the 24th of July, 1621; but dissensions afterwards occurred between the company to which the charter was granted and the king: insomuch that, partly by law, and partly by force, the company was ousted of all its rights, without retribution, after having expended 100,000*l.* in establishing the colony. King James suspended their powers by proclamation, July 15, 1624, and Charles I. took the government into his own hands. But this state of things did not continue for any long time; for the northern parts of the country were granted away from the original proprietors to the lords Baltimore and Fairfax, the first of these obtaining the rights of separate jurisdiction and government. In 1650, the parliament, conceiving itself as occupying the place and powers of the deposed king, began to assume and exercise a right over the colonies, by passing an act for prohibiting their trade with foreign nations. This colony, having maintained its opposition to Cromwell and the parliament, was induced, in 1651, to lay down its arms, on condition of previously securing their most essential rights by a solemn convention. This convention, as the colony imagined, ensured the ancient limits of the country, its free trade, its exemption from taxation, except by its own assembly, and exclusion of military forces. But this convention was violated in every particular by subsequent kings and parliaments, until at last resistance on the part of this and of the other colonies terminated in an appeal to arms; and this appeal being crowned with success, they issued a declaration of their independence, in July 1776, and the subsequent establishment of their "federal constitution," to which Virginia acceded after considerable opposition. See America and United *States*.

Virginia, a post-town of the county of Cavan, Ireland, situated on Lough Ramor; 40½ miles N.W. from Dublin.

VIRGINIAN Acacia, in *Botany*. See Robinia.

Virginian *Creeper*. See Clematis.

Virginian *Guelder-Rose*. See Spiræa *Opulifolia*.

Virginian *Poke*. See Phytolacca *Decandra*.

Virginian *Silk*. See Periploca.

VIRGINIANA Bolus, is a pure earth, of a compact texture, hard and heavy, of a pale red or rose colour, variegated with veins of deep red, and often with large spots and veins of bright yellow: it is of a glossy surface, does not colour the hands, adheres firmly to the tongue, melts with difficulty in the mouth, is of a rough astringent taste, leaves no grittiness in the teeth, and is diffusible with difficulty in water. It burns in the fire to an almost stony hardness, without any change of colour. It is the product of Pennsylvania, and most parts of America. This kind of bole has not yet been used in medicine.

VIRGINIS, Spica. See Spica.

VIRGINITY, Virginitas, the test or criterion of a virgin; or that which entitles her to the denomination.

In the first ages of the Christian church, virginity grew into great honour and esteem, insomuch that the women were admitted to make solemn vows of it in public. Yet was it held infamous among the Jews for a woman to die a maid.

The vestals among the ancients, and the nuns or religious among the moderns, found guilty of a breach of the vow of virginity, are allotted a severe punishment; the first to be buried alive, the latter to be immured.

The physicians, both ancient and modern, are exceedingly divided upon the subject of virginity, some holding that there are no certain marks or testimonies of it; and others that there are. Solomon says expressly, there are four things too wonderful for him to know: "the way of an eagle in the air; of a serpent on the rock; of a ship in the midst of the sea; and the way of a man in a maid;" which our translators have rendered, less justly, *the way of a man with a maid.*

Yet Moses established a test, which was to be conclusive among the Jews. The nuptial sheets, it seems, were to be viewed by the relations on both sides: and the maid's parents were to preserve them as a token of her virginity, to be produced, in case her husband should ever reproach her on that score.

In case the token of virginity was not found on them, she was to be stoned to death at her father's door.

This test of virginity has occasioned abundance of speculation about the parts concerned; but the nicest enquiries cannot settle any thing certain about them. Dr. Drake says expressly, that, whatever might be expected among the Jews, there is not the same reason to expect those tokens of virginity in these countries; for, besides that the Hebrews married extremely young, as is the custom in all the Eastern countries, there are several circumstances which may here frustrate such expectations, even in virgins not vitiated either by any male contact, or any wantonness of their own.

In effect, in these northern climates, the inclemency of the air exposes the sex to such checks of perspiration, as gives a great turn to the course of the humours, and drives so much humidity through the parts, as may extraordinarily supple

supple and relax those membranes from which the resistance is expected; and from which, in hotter countries, it might more reasonably be depended on.

What most commonly passes among us for the test of virginity is the *hymen* (which see); and yet the most curious among the anatomists are greatly divided, not only about the figure, substance, place, and perforations of this famous membrane, but even about the existence of it, some positively affirming, and others as flatly denying it. See GENERATION.

As nice a point as that of virginity is among anatomists, the midwives and matrons treat it with less diffidence. In the statutes of the sworn matrons, or midwives of Paris, containing likewise divers formulas of reports and depositions made in court, upon their being called to visit girls that made their complaint of being deflowered, they laid down fourteen marks on which to form a judgment.

Laur. Joubart, a famous physician of Montpelier, has transcribed three of these reports; one made to the provost of Paris, another in Languedoc, and a third in Berne. These reports are very consistent with each other, and contain fourteen marks of virginity, expressed in their proper terms, such as were received among the women in that profession, and authorized in court.

M. Joubart does not explain those terms, nor do we find any explanation of them any where, but in another report, of the 23d of October, 1672, inserted in the Picture of Love of Vennette, a physician of Rochel.

In Peru, and several other provinces in South America, we are assured by Pedro de Cieca, in the history of the Incas, &c. that the men never marry but on condition that the next relation or friend of the maid shall undertake to enjoy her before him, and take away her virginity. And our countryman, Lawson, relates the like of some of the Indian nations of Carolina. So little is the *flos virginis* valued in some places.

VIRGIÑIUS RUFUS, L., in *Biography*, a distinguished Roman citizen and commander, whose merit raised him to the consulate in the reign of Nero, A.D. 63. When the Gauls revolted under Vindex, A.D. 68, he marched to Besançon, in order to resist his designs. On this occasion the legions proclaimed him emperor, but he refused the title, alleging that the disposal of the empire belonged not to them, but to the senate and people. After the death of Nero, and the succession of Galba, he was again solicited by the army to become a candidate for the empire, and he was threatened with death by one of the tribunes if he did not comply with the wishes of the soldiers. But he resolutely resisted, and prevailed with them to acknowledge the new emperor. When Otho acquired temporary dominion, he endeavoured to engage the attachment of the Germanic legion, by conferring a second consulate, A.D. 69, on Virginius, their old commander; and after his death, he was a third time urged by the soldiery to accept the empire, but he persisted in refusing the offer. Upon Vitellius's entrance into Rome, Virginius was very unjustly suspected of a design to assassinate him; and though Vitellius had no doubt of his innocence, it was not without great difficulty that he preserved his life. From this time till the reign of Nerva be lived in retirement, calling the place of his retreat near Alaium "the rest of his old age." To Pliny the younger he was guardian, and was always regarded by him with filial veneration; and at Rome he was respected as one of the most excellent of its citizens. "He read," according to the account given of him by Pliny, "verses and histories of which he was the subject, and lived, as it were, with his own posterity;" and Pliny relates the following instance of his love of historical fidelity. Cluvius Rufus, an eminent historian, said to him, "You are sensible, Virginius, of the fidelity required in a writer of history; if, therefore, you meet with any thing in my work which is displeasing to you, I request that you will pardon it." He replied, "Are you ignorant, Cluvius, that my purpose, in doing what I have done, was that you writers might freely say what you should think fit." In his eighty-third year Nerva honoured him by advancing him to a third consulate, as his own colleague in that office. On this occasion he intended to deliver a discourse, and whilst he was preparing at home for the recitation of it, a large book fell from his hand upon the floor; and, in stooping for it, his foot slipped, and in the fall he broke his thigh. The fracture occasioned his death, A.D. 97. His remains were honoured with a public funeral, and his eulogy was pronounced by Cornelius Tacitus. The epitaph which he had written for himself was comprised in two lines, and merely recorded one of the principal actions of his life, with its motive:

> "Hic situs est Rufus, pulso qui Vindice quondam
> Imperium asseruit, non sibi, sed patriæ."

"Here Rufus lies, who, by the repulse of Vindex, secured the empire, not for himself, but for his country." Crevier. Plin. Epist. Gen. Biog.

VIRGO, in *Astronomy*, one of the signs or constellations of the zodiac, into which the sun enters in the middle of August. See CONSTELLATION.

The stars in the constellation Virgo, in Ptolemy's catalogue, are 32; in Tycho's, 33; in Hevelius's, 50; and in the Britannic, 110.

VIRGULA, in *Grammar*, a term which Latin, French, and some other authors use for a point in writing, usually called by us, *comma*.

Virgulas, F. Simon observes, are an invention of the modern grammarians, to give the greater clearness to discourse. The use of them was unknown to the ancient Greeks and Romans, who wrote all without taking off the pen, so that their books lie all together, without any distinction of points and virgulas.

VIRGULA, or *Virgola*, in *Music*, the tail or stem to a note. The first notes in the old time-table had no tails till the minim was invented, which had a tail to distinguish it from the semibreve, as the crotchet had a black head to distinguish it from the minim, of which the head is white, and the quaver a hook to the tail, to distinguish it from the crotchet, of which the tail was straight, &c.

VIRGULA *Divina*, or *Baculus divinatorius*, a forked branch in form of a Y, cut off a hazle-tree, by means of which people have pretended to discover mines, springs, &c. under ground.

The method of using it is this: the person who bears it walking very slowly over the places where he suspects mines or springs may be, the effluvia exhaling from the metals, or vapour from the water, impregnating the wood, makes it dip or incline, which is a sign of a discovery.

We find no mention made of this virgula in any author before the 11th century; but from that time it has been in frequent use. Divers fine names have been invented for it, some calling it *caduceus*, others *Aaron's rod*, &c.

Some dispute the matter of fact, and deny it to be possible; others, convinced by the great number of experiments alleged in its behalf, look out for the natural causes of them. The corpuscles, say these authors, rising from the springs, or minerals, entering the rod, determine it to bow down, in order to render it parallel to the vertical lines which the effluvia describe in their rise.

In

In effect, the mineral or watery particles are supposed to be emitted by means of the subterraneous heat, or of the fermentations in the entrails of the earth: and the virgula, being of a light porous wood, gives an easy passage to those particles, which are also very fine and subtile; the effluvia then driven forwards by those that follow them, and oppressed, at the same time, by the atmosphere incumbent on them, are forced to enter the little interstices at the fibres of the wood; and, by that effort, they oblige it to incline or dip down perpendicularly, to become parallel with the little columns which those vapours form in their rise.

A late writer has recited no less than six hundred experiments, made with all possible attention and circumspection, and several of which are very curious and extraordinary, in order to ascertain the facts attributed to the divining rod; and he has also undertaken to unfold their resemblance to the admirable and uniform phenomena of electricity and magnetism. See M. Thouvenel's Memoire Physique et Medicinale Montrant des Reports evidens entre les Phenomenes de la Baguette divinatoire, &c. 12mo. Paris, 1781.

Mr. Pryce has collected several observations on the nature and use of the virgula divinatoria, in his Mineralog. Cornub. lib. iii. cap. 1.

VIRGULARIA, in *Botany*, so called from *virga*, in allusion to its slender wand-like branches, by the authors of the Flora Peruviana.—Poiret in Lamarck Dict. v. 8. 679.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*, Linn. *Scrophulariæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, bell-shaped, permanent, somewhat two-lipped, with ten angles, and five sharp spreading teeth; the two lowermost a little distant. *Cor.* of one petal, bell-shaped, irregular; tube a little recurved; mouth inflated, gibbous: limb in five roundish, concave segments; the two uppermost shortest, ascending; three lowermost spreading, the middle one narrowest. *Stam.* Filaments four, thread-shaped, compressed, hairy at their base, inserted into the tube, two of them shorter than the rest; anthers inclining, arrow-shaped, of two cells. *Pist.* Germen superior, obovate; style awl-shaped, recurved, as long as the corolla; stigma oblong, compressed, of two lobes, the uppermost channelled, half sheathing the lower. *Peric.* Capsule invested with the calyx, oval, obtuse with a point, with two furrows, two cloven valves, and two cells, the partition contrary. *Seeds* numerous, very small, inserted into a convex central receptacle, attached to each side of the partition.

Eff. Ch. Calyx five-toothed, with ten angles. Corolla somewhat bell-shaped, irregular, recurved. Stigma with one lobe sheathing the other. Capsule of two cells, two valves, and a transverse partition. Seeds numerous.

This genus appears to come near *Buddlæa*. It is said to consist of only two known species, natives of Peru, of a shrubby habit, with numerous slender twigs. Neither of the species has as yet been described.

VIRGULTUM, in our ancient *Law-Books*, is used for an holt, or plantation of twigs, or osiers.

Sometimes, also, for a coppice of young wood. "Et præterea concedo virgultum meum, et totam communiam dominii mei." Mon. Angl.

In another place of the same work, *virgultum*, or rather *virgulta*, may be taken for *virgata; viz.* "Dedit prædictæ ecclesiæ unam virgultum terræ in manerio de Crumptone." See Yard-*Land*.

VIRIBALLUM, in *Ancient Geography*, a promontory on the western side of the isle of Corsica, between the gulf Casulus and the mouth of the river Cicidius: supposed to be Punta di Adiazza.

VIRICONIUM. See Uriconium.

VIRIDARIO Eligendo, in *Law*, a writ that lies for the choice of a verderor in the forest. See Verderor.

VIRIDE Æris, the same as ærugo, or *verdigrease*, which see.

VIRIDELLUS, a word used by some medical writers to express the epilepsy, and, by some of the chemical ones, as a name for the common green vitriol.

VIRIEU, in *Geography*, a town of France, in the department of the Isere; 6 miles S.S.E. of La Tour du Pin.

Virieu *le Grand*, a town of France, in the department of the Ain; 6 miles N. of Belley.

VIRILE, something that belongs, or is peculiar to man, or the male sex.

Thus, virile member, *membrum virile*, is frequently used for the penis.

Virile *Age*, *Ætas virilis*, is the strength and vigour of a man's age, *viz.* from thirty to forty-five years, which is an age in which we are equally removed from the extremes of youth and old age. See Age.

The civil lawyers only make one age of youth and virility, and yet their different temperatures seem to require a distinction, for which reason some compare youth to summer, and virility to autumn.

At Rome, the youth quitted the prætexta at fourteen or fifteen years of age, and took the virile gown, *toga virilis*, to shew, it seems, that they then entered on a serious age.

M. Dacier will have it, that children do not take the prætexta till thirteen years of age, nor quit it for the toga virilis till seventeen.

VIRILIA, a man's genitals, or privy members, including the penis and testes. See Generation.

The cutting off the virilia, according to Bracton, was felony by common law; and that whether the party were consenting or not.

"Henricus Hall et A. uxor ejus capti et detenti in prisona de Evilchester, eo quod rectati fuerunt, quod ipsi absciderunt virilia Johannis Monachi, quem idem Henricus deprehendit cum prædicta A. uxore ejus." Rot. Claus. 13 Hen. III.

VIRILIS *Testis Musculus*, in *Anatomy*, a name given by Vesalius and others, to the muscle generally known by the name of the cremaster.

VIRIMGAM, in *Geography*, a town of Hindoostan, in Guzerat; 55 miles W. of Amedabad.

VIRITES, a name by which the writers of the middle ages have called the pyrites.

VIRIVILLE, in *Geography*, a town of France, in the department of the Isere; 12 miles N.N.W. of St. Marcellin.

VIRNENBURG, a town of France, in the department of the Rhine and Moselle, late capital of a county, to which it gave name; 20 miles W. of Coblentz. N. lat. 50° 27′. E. long. 6° 58′.

VIROLA, in *Botany*, the vernacular name in Guiana of a sort of bastard Nutmeg-tree; Aubl. Guian. 904. t. 345. Juss. 81. (See Myristica.) Aublet calls it *V. sebifera*, and describes it as a tree from thirty to sixty feet high, and above two feet in diameter, with numerous spreading branches. *Leaves* alternate, stalked, oblong, acute, entire, wavy, eight inches long; downy beneath. *Flowers* dioecious, in compound, dense, axillary panicles. *Anthers* but three. *Capsule* globose, pointed, coriaceous, of two valves, containing a *seed* like a nutmeg, enveloped in a many-cleft tunic, like mace, and yielding a copious oily acrid substance, used for making candles.—This tree is common in Cayenne and Guiana. Swartz in his Fl. Ind. Occ. 1129, and Willd.

Willd. in Sp. Pl. v. 4. 872, have referred it to *Myriſtica*, by the ſpecific name of *ſebifera*, where, notwithſtanding our learned friend Mr. Brown's doubts, we ſhould think it ought to remain.

VIROSIDUM, in *Ancient Geography*, a town of Great Britain, thought by Camden to be Warwick, in Cumberland.

VIROVESSA, a town of Hiſpania Citerior, S.E. of Julio-Brigduna, one of the ten cities of the Autrigones, according to Pliny. In the Itin. Anton. it is marked on the route from the Gauls to the place named Ad Legionem Geminum, between Segaſamundum and Segeſamona. Ptolemy calls it Vireuſta, and it is now named Briviefca.

VIROVIACUM, a place marked in the Itin. Anton. between Caſtellum and Turnacum, or Caſſel and Tournai, at the ſame diſtance from both places.

VIROUR, in *Geography*, a town of Hindooſtan, in Tinevelly; 57 miles N.N.E. of Neermul.

VIRPRINACH, a town of Iſtria; 9 miles E.N.E. of Pedena.

VIRREIES, three ſmall iſlands among the Philippines. N. lat. 13° 18′. E. long. 121° 48′.

VIRSBO, a town of Sweden, in Weſtmanland; 24 miles N. of Stroemſholm.

VIRTON, a town of France, in the department of the Foreſts; 10 miles S.W. of Arlon.

VIRTSUNGIANUS Ductus, or *Ductus Virtſungii*, ſo called from the inventor, Virtſungius, a profeſſor at Padua, in *Anatomy*, a canal, more uſually called *ductus pancreaticus*. See Pancreas and Pancreatic *Juice*.

VIRTU, Ital. force, talents.

VIRTUAL, Potential, ſomething that has a power, or virtue, of acting, or doing.

The term is chiefly underſtood of ſomething that acts by a ſecret inviſible cauſe, in oppoſition to *actual* and *ſenſible*.

Virtual *Focus*, in *Optics*. See Focus.

VIRTUALITY, Virtualitas, in the *Schools*, denotes ſome mode or analogy in an object, which, in reality, is the ſame with ſome other mode, but, out of regard to contradictory predicates, is conſidered as if diſtinct from it.

And hence ariſe what we call *virtual diſtinctions*, by which one virtuality is diſtinguiſhed from another, not one thing from another.

Thus it is, the divine nature is diſtinguiſhed from the divine perſon; and the divine underſtanding from the divine will.

VIRTUALLY, Virtualiter, is applied to a mode of exiſtence. A thing is ſaid to be virtually any where, when it is deemed to be there by ſome virtue, influence, or other effect, produced by it. Thus the ſun is virtually on earth, *i. e.* by his light, heat, &c.

A thing is alſo ſaid to be virtually preſent, when the virtues, or properties, belonging to it, and iſſuing from it, remain. In which ſenſe, the forms of the elements are held to be virtually in mixed bodies.

A thing is alſo ſaid to be a cauſe virtually, or a virtual cauſe, and that two ways: the firſt, when there is no real diſtinction between it and the effect attributed to it; and yet it is conceived by us as if it were really the cauſe of it. Thus, immutability in God is the cauſe of eternity.

Secondly, when any effect is not of the ſame kind with the cauſe, and yet the cauſe has the power or virtue of producing the effect; thus the ſun is not formally, but virtually hot; and fire is not contained formally, but virtually, in heat.

VIRTUE, Virtus, a term uſed in various ſignifications. In the general, it denotes *power*, or *perfection*, of any thing, whether natural or ſupernatural, animate or inanimate, eſſential or acceſſary. Hence the virtues, that is, the powers of God, angels, men, plants, elements, &c.

Virtue, in its more proper and reſtrained ſenſe, is uſed by ſome writers to ſignify an habit, which improves and perfects the poſſeſſor and his actions. Accordingly, in this ſenſe of the term, virtue is a principle of acting or doing well and readily; and as there are two faculties or powers in man from which all his actions proceed, *viz.* the underſtanding and the will, ſo the virtue (as theſe authors ſay), by which he is perfected, or by which he is diſpoſed to do all things rightly, and to live happily, muſt be two-fold; the one of the underſtanding, the other of the will. That which improves the underſtanding, is called *intellectual*, or *dianoetic;* and that, the will, *moral*, or *ethical*. For, ſince there are two things required in order to live aright, *viz.* to know what ſhould be done, and, when known, readily to perform it; and ſince man is apt to err various ways in each reſpect, unleſs regulated by diſcipline, &c. he alone can deport himſelf rightly in his whole courſe of life, whoſe underſtanding and will have attained their utmoſt perfection.

Virtue, *Intellectual*, then, according to Ariſtotle, is an habit of the reaſonable ſoul, by which it conceives or ſpeaks the truth, either in affirming or denying.

The virtues which come under this claſs are divided into *ſpeculative*, which are thoſe converſant about neceſſary things, that can only be known or contemplated; and *practical*, which are converſant about contingent things, that may likewiſe be practiſed.

Ariſtotle has another diviſion of intellectual virtue, derived from the ſubject; as ſome of them are ſeated in the ἐπιστημονικὸν, or *contemplative part; viz.* thoſe converſant about neceſſary things, as *ſcience*, *wiſdom*, *intelligence:* and others in the λογιστικὸν, or *practical part*, ſuch as thoſe converſant about contingent things, as *prudence*, *art*, &c.

Virtue, *Moral*, is defined by Ariſtotle to be an elective habit, placed in a mediocrity, determined by reaſon, and as a prudent man would determine. See the ſequel of this article.

We ſhall here ſubjoin as conciſe an account as poſſible of the principal ſyſtems of morality or ethics that have been propoſed by different writers, both ancient and modern, who have treated of this ſubject; from which the reader will be able to diſcover the opinions that have chiefly prevailed with regard to the nature, foundation, and obligation of virtue, referring for a more extended and elaborate account of the ſubject to the article *Moral* Philosophy.

It may be proper to premiſe, that virtue has been diſtinguiſhed into *abſtract* or *abſolute*, and *relative* or *practical* virtue. *Abſtract* virtue is, moſt properly, a quality of the external action or event; and denotes what an action is, conſidered independently of the ſenſe of the agent; or what, in itſelf and abſolutely, it is right ſuch an agent, in ſuch circumſtances, ſhould do, and what, if he judged truly, he would judge he ought to do. *Practical* virtue, on the contrary, has a neceſſary relation to, and dependence upon, the ſenſe and opinion of the agent concerning his actions: or it ſignifies what he ought to do, upon ſuppoſition of his having ſuch and ſuch ſentiments of things. Agreeably to this diſtinction, good actions have been by ſome divided into ſuch as are *materially* good, and ſuch as are *formally* ſo. The enquiry concerning the foundation of virtue refers to abſolute virtue: and if it be aſked what the foundation of virtue is, we may mean either, what is the true account or reaſon that ſuch and ſuch actions are right, or apprehended as ſuch by us; or, what are the primary principles and heads

heads of virtue, *i. e.* the considerations inferring obligation in particular cases, and rendering particular actions right and fit to be done; or, moreover, what are the motives, causes, and reasons, which engage or attach us to it, and support the practice of it in the world. In this last sense the term must be used by those who represent the will of God, self-interest, the reasons of things, and the moral sense, as all distinct and coincident foundations of virtue.

An ingenious writer, in forming his arrangement of the different systems of moral philosophy, of which we shall here avail ourselves, observes, that in treating of the principles of morals, there are two questions to be considered: first, wherein does virtue consist, or what, in temper and conduct, constitutes the excellent and laudable character? and secondly, by what power of the mind is this character, whatever it be, recommended to us? The first question is examined when we consider whether virtue consists in benevolence, as Dr. Hutcheson imagines; or in acting suitably to the different relations of persons and things, as Dr. Clarke supposes; or in a conformity to the will of God; or in the prudent pursuit of our own true happiness, as others have maintained. In reference to the second question we consider, whether the virtuous character, whatever it consists in, be recommended to us by self-love, which makes us perceive that this character, both in ourselves and others, tends most to promote our own private interest; or by reason, which points out to us the difference between one character and another, in the same manner as it does that between truth and falsehood; or by a peculiar power of perception, called a moral sense, which this virtuous character gratifies and pleases, as the contrary disgusts and displeases it; or lastly, by some other principle in human nature, such as the modification of sympathy, or the like.

The different accounts which have been given of the nature of virtue, may be reduced to three different classes. According to some, virtue, or the virtuous temper of mind, does not consist in any one species of affections, but in the proper government and direction of all our affections, which may be either virtuous or vicious, according to the objects which they pursue, the principles and motives that direct the pursuit of them, and the degree of vehemence with which they pursue them. According to these authors, therefore, virtue consists in propriety.

According to others, virtue consists in the judicious pursuit of our own private interest and happiness, or in the proper government and direction of those selfish affections which aim solely at this end. In the opinion of these authors, virtue consists in prudence.

Others again make virtue consist in those affections only which aim at the happiness of others, not in those which aim at our own. According to them, therefore, disinterested benevolence is the only motive which can stamp upon any action the character of virtue.

According to Plato, Aristotle, and Zeno, virtue consists in propriety of conduct, or in the suitableness of the affection from which we act to the object which excites it. In the system of Plato, reason is the judging and ruling faculty; and virtue, according to him, consists in that state of mind in which every faculty confines itself within its proper sphere, without encroaching on that of any other, and performs its proper office with that precise degree of vigour which belongs to it: or, in other words, virtue consists in propriety of conduct.

Virtue, according to Aristotle, (as we have already stated,) consists in the habit of mediocrity, according to right reason; every particular virtue lying in a kind of medium between two opposite vices; and thus, by making virtue to consist in practical habits, he probably had in view to oppose the doctrine of Plato, who seems to have thought that just sentiments concerning what was fit to be done or avoided were of themselves sufficient to constitute the most perfect virtue. Aristotle, on the contrary, was of opinion, that no conviction of the understanding was capable of getting the better of inveterate habits, and that good morals arose not from knowledge but from action.

Others disallow the Peripatetic notion of virtue, as placed in a habit: for a habit, or hability, say they, includes two things; a custom, and facility; the first as a cause, and the second as an effect: so that a habit is nothing but a facility acquired by custom. They, therefore, who make virtue a habit of doing well, must, of necessity, ascribe it to a frequent exercise of good actions. But this cannot be; for the virtue must be before the good actions; and the habit, after them. Indeed, whence should the actions proceed, but from virtue? Virtue, therefore, is before the good actions, and, certainly, before a habit, resulting from a frequency of good actions. Hence, they define virtue to be a firm purpose, or resolution, of doing whatever right reason demands to be done. For, though a custom of doing well be required to make a person esteemed good among men; yet it does not follow that that custom, or habit, is the formal cause of that denomination, or the goodness itself.

Besides, from the definition of Aristotle, none can know what virtue is; for what mediocrity is, or what an extreme, in which he supposes vice to consist, can never be determined, till we know what is agreeable to the nature of things; and, moreover, the definition is faulty, because there are some branches of virtue which cannot be carried to an extreme.

In this connection we may observe, that as on various occasions mankind act more from habit than reflection, and that they are in a great degree passive under their habits, the exercise of virtue, the guilt of vice, or the use of moral and religious knowledge, consist in forming and contracting these habits. Hence it appears, that it is in many cases a very important and useful principle of virtue (see HABIT); and we shall thus be able to explain the nature of *habitual* virtue. Whatever definition of virtue we may adopt, a man may, in fact, perform many acts that justly merit the denomination of virtuous, without thinking at the time of the principle from which he acts; whether it be rectitude, benevolence, a regard to the will of God, or a view to his own happiness.

According to Zeno and the Stoics, virtue consisted in choosing and rejecting all different objects and circumstances according as they were by nature rendered more or less the objects of choice or rejection; in selecting those which were most to be chosen, when all could not be obtained; and in selecting those which were least to be avoided, when all could not be avoided. This constituted the essence of virtue, and was what the Stoics called to live consistently, to live according to nature, and to obey those laws which nature, or the Author of nature, prescribed for our conduct: and in this course, they required the most perfect apathy, and considered every emotion which might in the smallest degree disturb the tranquillity of the mind, as the effect of levity and folly.

Besides these ancient there are some modern systems, according to which virtue consists in propriety; or in the suitableness of the affection from which we act, to the cause or object which excites it. The system of Dr. Clarke, Mr. Balguy, and other writers, which places virtue in acting according to the relations of persons and

 things,

things, in regulating our conduct according to the fitness or incongruity which there may be in the application of certain actions to certain things, or to certain relations: that of Mr. Grove and others, who explain virtue by saying, that it is the conformity of our actions to reason or wisdom; that of many others, who represent it as originating in a regard to the will of God; that of Mr. Wollaston, which places it in acting according to the truth of things, actions as well as words having a language, so that when this action is agreeable to the nature of things, the action is virtuous, and when it implies a false assertion, vicious: that of lord Shaftesbury, which places it in maintaining a proper balance of the affections, and allowing no passion to go beyond its proper sphere, or in a certain just disposition of a rational creature towards the moral objects of right and wrong: are all of them reducible to the same fundamental idea of propriety, as it has been explained.

The most ancient of those systems, which make virtue consist in prudence, is that of Epicurus, who maintained that bodily pleasure and pain were the sole ultimate objects of natural desire and aversion, and were the sources of those of the mind; and who placed the most perfect happiness which man was capable of enjoying in ease of body, and in tranquillity of mind. According to him, virtue did not deserve to be pursued for its own sake, nor was itself one of the ultimate objects of natural appetite, but was eligible on account of its tendency to prevent pain, and to procure ease and pleasure. Among our modern writers on the subject of morality, there have been some who have placed all virtue in a wise regard to our own interest: this seems to have been the opinion of Dr. Waterland, Dr. Rutherford, &c.

The system which makes virtue consist in benevolence, seems to have been the doctrine of most of those philosophers who, about and after the age of Augustus, called themselves Eclectics, who pretended to follow chiefly the opinions of Plato and Pythagoras, and who are commonly known by the name of the later Platonists. In the divine nature, according to them, benevolence was the sole principle of action, and directed the exertion of all the other attributes. The wisdom of the Deity was employed in finding out the means for bringing about those ends which his goodness suggested, as his infinite power was exerted to execute them. Benevolence, however, was a supreme and governing attribute, to which the others were subservient, and from which the whole excellency of the divine operations was ultimately derived. The whole perfection and virtue of the human mind consisted in some resemblance and participation of the divine perfections, and, consequently, in being filled with the same principle of benevolence, which influenced all the actions of the Deity. This system, as it was much esteemed by many of the ancient fathers of the church, was, after the Reformation, adopted by several divines of the most eminent piety and learning, and of the most amiable manners; particularly by Dr. Ralph Cudworth, Dr. Henry More, and Mr. John Smith, of Cambridge. Mr. Bayes has also more lately considered benevolence as the spring of the divine actions; whilst Mr. Balguy referred them all to rectitude, and Mr. Grove to wisdom. The subject was ably canvassed by these writers, and several excellent pamphlets published on the occasion. But of all the patrons of the system of benevolence, the late Dr. Hutcheson pursued it to the greatest extent, and with distinguished acuteness and accuracy. Accordingly, he defines moral goodness to be a quality apprehended in some actions, which produces approbation and love towards the actor, from those who receive no benefit from the action; and he observes, that the mixture of any selfish motive diminishes or altogether destroys the merit which would otherwise have belonged to any action, and, therefore, that virtue must consist in pure and disinterested benevolence alone. Others, and particularly Dr. Cumberland, in his Law of Nature, have placed the whole of virtue in the love of God and our fellow-creatures: to this purpose he observes (De Legat. Nat. cap. i. sect. 4.), the foundation of all natural law is this, that the greatest benevolence of every rational agent towards all forms the happiest state of every and of all the benevolent, as far as is in their power, and is necessarily requisite to the happiest state which they can attain; and, therefore, the common good is the supreme law. Archdeacon Paley, deservedly esteemed as one of our most popular modern writers, defines virtue to be "the doing good to mankind, in obedience to the will of God, and for the sake of everlasting happiness." According to this definition, in our judgment partly just and partly erroneous (see *Moral* PHILOSOPHY), but comprehending the sentiments of those who refer virtue to benevolence, to the will of God, and to a regard to their own happiness, the good of mankind is the subject, the will of God the rule, and everlasting happiness the motive of human virtue.

The three systems above recited comprehend the principal accounts which have been given of the nature of virtue. To one or other of these, all the other definitions or descriptions of virtue, how different soever they may appear, are easily reducible. That system which places virtue in obedience to the will of the Deity, may be counted among those which makes it consist in prudence, or among those which make it consist in propriety. When it is asked, why we ought to obey the will of the Deity, the question can admit but of two different answers. It must either be said, that we ought to obey the will of the Deity because he is a being of infinite power, who will recompence or punish: or it must be said, that, independent of any regard to our own happiness, or to rewards and punishments of any kind, there is a congruity and fitness that a creature should obey its Creator, and a limited imperfect being submit to one of infinite perfection. In the first case, virtue consists in prudence, or in the proper pursuit of our own final and supreme interest; since it is upon this account that we are obliged to obey the will of the Deity: and in the latter case, virtue must consist in propriety; since the ground of our obligation to obedience is the suitableness or congruity of the sentiments of humility and submission to the superiority of the object which excites them. That system which places virtue in utility, coincides too with that which makes it consist in propriety.

All the systems above recited suppose, that there is a real and essential distinction between virtue and vice, whatever these qualities may consist in. There is a real and essential difference between the propriety and impropriety of any affection; between benevolence and any other principle of action; between real prudence and short-sighted folly or precipitate rashness. And the general tendency of all these systems is to encourage the best and most laudable dispositions and habits.

There are, however, some other systems, which seem altogether to annihilate the distinction between vice and virtue, and the tendency of which is, therefore, wholly pernicious: such are the systems of Rochefoucault, and Mandeville, who ascribes actions commonly accounted virtuous to the frivolous motive of vanity: treating every thing as vanity that has any reference to what are, or ought to be the sentiments of others; and by means of such sophistry he establishes his favourite conclusion, that private vices are public benefits.

After the enquiry concerning the *nature* of virtue, the next

next question of importance in moral philosophy concerns the principle of *approbation* (which see), or that faculty of the mind which renders certain characters agreeable or disagreeable to us, makes us prefer one tenor of conduct to another, denominate the one right and the other wrong, and consider the one as the object of approbation, honour, and reverence, and the other as that of blame, censure, and punishment. Three different accounts have been given of this principle of approbation. According to some, we approve and disapprove both of our own actions and of those of others, from self-love only, or from some view of their tendency to our own happiness or disadvantage. (See UTILITY.) According to others, reason, the same faculty by which we distinguish between truth and falsehood, enables us to distinguish between what is fit and unfit both in actions and affections; according to others, this distinction is altogether the effect of immediate sentiment and feeling, and arises from the satisfaction or disgust with which the view of certain actions or affection inspires us.

Those who account for the principle of approbation from self-love, differ in their representation of its influence. According to Mr. Hobbes, and many of his followers, man is driven to take refuge in society, not by any natural love which he bears to his own kind, but because without the assistance of others, he is incapable of subsisting with ease or safety: virtue being the great support, and vice the great disturber of human society, whence the former necessarily pleases, and the latter is as naturally offensive. Moreover, a state of nature, according to Mr. Hobbes, being a state of war, so that antecedent to the constitution of civil government, there could be no safe and peaceable society among men; to preserve society was to support civil government, and the support of civil government depends upon the obedience that is paid to the supreme magistrate; hence it was inferred, that the laws of the civil magistrate ought to be regarded as the sole ultimate standard of what was just and unjust, right and wrong. See HOBBISM.

In order to confute so odious a doctrine, it was necessary to prove, that antecedent to all law or positive institution, the mind was naturally endowed with a faculty, by which it distinguished in certain actions and affections the qualities of right, laudable, and virtuous, and in others, those of wrong, blameable, and vicious. This faculty was reason, which pointed out the difference between right and wrong, in the same manner in which it did between truth and falsehood. Right and wrong, it is argued, denote simple ideas, and are, therefore, to be ascribed to some immediate power of perception in the human mind, which power is the understanding. Besides, all actions have a nature; some character belongs to them, and there is something that may be affirmed of them, *i. e.* some are right and others wrong. But if our actions are, in themselves, either right or wrong, or any thing of a moral and obligatory nature, which can be an object to the understanding, it must follow that in themselves they are all indifferent. From such reasoning it follows, that morality is eternal and immutable: because right and wrong denote what actions are; and whatever any thing is, that it is not by will, or decree, or power, but by nature and necessity. No will can render any thing good and obligatory, which was not so antecedently and from eternity; or any action right, that is not so in itself. In this view of it, morality appears not to be, in any sense, factitious, or the arbitrary production of any power, human or divine; but equally everlasting and necessary with all truth and reason. Some have supposed, however, that, in men, the rational principle, or the intellectual discernment of right and wrong, should be aided by somewhat instinctive. Of this number is Dr. Price, who, in his reasoning concerning the original of our ideas of the *beauty* and *deformity* of actions, observes, that in contemplating the actions and affections of moral agents, we have both a perception of the understanding, and a feeling of the heart; and that the latter, or the effects in us accompanying our moral perceptions, are deducible from two springs; they partly depend on the positive constitution of our natures, but the most steady and universal ground of them is the essential congruity or incongruity between the object and faculty; in other words, *placet suapte natura — virtus:* Sen. or, *Etiamsi à nullo laudetur, natura est laudabile.* Tully. See COMMON SENSE.

This leads us to mention those systems which make sentiment the principle of approbation; these may be distributed into two different classes.

According to some, the principle of approbation is founded upon a sentiment of a peculiar nature, upon a particular power of perception exerted by the mind at the view of certain actions and affections; some of which affecting this faculty in an agreeable, and others in a disagreeable manner, the former are stamped with the characters of right, laudable, and virtuous; the latter with those of wrong, blameable, and vicious.

This sentiment being of a peculiar nature, distinct from every other, and the effect of a particular power of perception, they give it a particular name, and call it a moral sense.

Dr. Hutcheson, having taken great pains to prove that the principle of approbation was not founded on self-love, and that it could not arise from any operation of reason, supposed it to be a faculty of a peculiar kind, with which nature had endowed the human mind, in order to produce this particular and important effect. This power, which he called a moral sense, he supposed to be somewhat analogous to the external senses.

According to his system, the various senses or powers of perception, from which the human mind derives all its simple ideas, were of two different kinds, of which one were called the direct or antecedent, the other the reflex or consequent senses. The direct senses were those faculties from which the mind derived the perception of such species of things, *e. gr.* sounds and colours, as did not pre-suppose the antecedent perception of any other quality or object. The reflex or consequent senses, were those faculties from which the mind derived the perception of such species of things as pre-supposed the antecedent perception of some other; such as harmony and beauty.

The moral sense was considered as a faculty of this kind. That faculty, which Mr. Locke calls reflection, and from which he derived the simple ideas of the different passions and emotions of the human mind, was according to Dr. Hutcheson a direct internal sense. That faculty again, by which we perceived the beauty or deformity, the virtue or vice of those different passions and emotions, was a reflex internal sense.

Dr. Hutcheson endeavoured still farther to support this doctrine, by shewing that it was agreeable to the analogy of nature, and that the mind was endowed with a variety of other reflex senses exactly similar to the moral sense; such as a sense of beauty and deformity in external objects; a public sense, by which we sympathize with the happiness or misery of our fellow-creatures; a sense of shame and honesty, and a sense of ridicule.

To this system it has been objected, that it makes virtue an arbitrary thing, depending on the positive constitution of our minds; that right and wrong are only qualities of our minds and sensations, depending on the particular frame and structure

structure of our natures, which have no other measure or standard besides every one's private structure of mind and sensations; that it implies, that a creature with intelligence, reason, and liberty, could not have performed one good action, without that instinctive affection to which Dr. Hutcheson ascribes every good action; that it makes brutes capable of virtue, because they are capable of affections; that it estimates the excellency of characters by the strength of passions, by no means in our power; and that, upon the whole, it gives us a much less honourable idea of virtue than other systems, which make it to consist in the agreement of the actions of an intelligent being, with the nature, circumstances, and relations of things, and of which reason is the judge.

We shall only add, that the opinion of those who maintain our ideas of morality to be derived from sense, is far from being entirely modern. There were, among the ancients, philosophers, particularly Protagoras and his followers, who entertained a like opinion, but extended it much farther, that is, to all science, denying all absolute and immutable truth, and asserting every thing to be relative to perception.

According to others, who ascribe the principle of approbation to sentiment, there is no occasion for supposing any new power of perception; nature acting in this, as in all other cases, with the strictest economy, and producing a multitude of effects from one and the same cause; and therefore, sympathy, they say, a power which has always been taken notice of, and with which the mind is manifestly endowed, is sufficient to account for all the effects ascribed to this peculiar faculty. Of this number is Dr. Adam Smith. (See SYMPATHY.) See also Smith's Theory of Moral Sentiments, passim; and particularly part i. sect. 1, 2, 3.

The term *obligation* of virtue, or moral obligation, frequently occurs among moral writers; and it is very differently defined and explained. Mr. Balguy defines obligation to be a state of the mind into which it is brought by perceiving a reason for action; but an excellent writer observes, that this is the effect of obligation perceived, rather than obligation itself.

Other writers, with Dr. Cumberland, have defined obligation the necessity of doing a thing in order to be happy: but if this be the only sense of obligation, what is meant when we say, a man is obliged to study his own happiness? In this case we can only mean, that it is right to study our own happiness, and wrong to neglect it.

Dr. Warburton maintains, that moral obligation always denotes some object of will or law, or implies some obliger; and accordingly, the word obligation signifies only the particular fitness of obeying the divine will, and cannot properly be applied to any other fitness, which is restraining the sense of the word in a manner unwarranted by the common use of it.

Moral obligation, says Dr. Paley, is like all other obligations; and all obligation is nothing more than an *inducement* of sufficient strength, and resulting, in some way, from the command of another. As the will of God is our rule, to inquire what is our duty, or what we are obliged to do, in any instance, is, in effect, to inquire, what is the will of God in that instance? This is to be determined either by his express declarations, which must be sought for in scripture, or by the light of nature, *i. e.* what we can discover of his designs and disposition from his works; and therefore it is absurd to separate natural and revealed religion from one another.

Mr. Hume, in his fourth Appendix to his Principles of Morals, has been pleased to complain of the modern scheme of uniting ethics with the Christian theology. They who find themselves disposed to join in this complaint will do well to observe what Mr. Hume himself has been able to make of morality without this union. And for that purpose, let them read the second part of the ninth section of the above essay; which part contains the practical application of the whole treatise,—a treatise, which Mr. Hume declares to be "incomparably the best he ever wrote." When they have read it over, let them consider, whether any motives there proposed are likely to be found sufficient to withhold men from the gratification of lust, revenge, envy, ambition, avarice, or to prevent the existence of these passions. Unless they rise up from this celebrated essay, says archdeacon Paley, with stronger impressions upon their minds, than it ever left upon mine, they will acknowledge the necessity of additional sanctions. But the necessity of these sanctions is not now the question. If they be *in fact established*, if the rewards and punishments held forth in the gospel will actually come to pass, they *must* be considered. Such as reject the Christian religion are to make the best shift they can to build up a system, and lay the foundations of morality without it. But it appears to be a great inconsistency in those who receive Christianity, and expect something to come of it, to endeavour to keep all such expectations out of sight in their reasonings concerning human duty.

Dr. Hutcheson says, a person is obliged to an action, when every spectator, or he himself, upon reflection, must approve his action, and disapprove omitting it. Obligation to act, however, and reflex approbation or disapprobation, do, in one sense, always accompany and imply one another; yet they seem as different as an act and an object of the mind, or as perception and the truth perceived. After all it may be observed, that however variously and loosely this word may be used, its primary and original signification coincides with rectitude: right implies duty in its idea, so that to perceive an action to be right, is to see a reason for the doing it in the action itself, abstracted from all other considerations whatever; and this perception, this acknowledged rectitude in the action, is the very essence of this obligation, or that which commands the approbation and choice, or binds the conscience of every rational being. See Price's Review of the Principal Questions, &c. in Morals, chap. vi.; Adams's Sermon on the Nature and Obligation of Virtue; and Paley's Principles of Moral and Political Philosophy, vol. i.

Moralists usually distinguish four principal, or, as they are vulgarly called, *cardinal* virtues; *viz. prudence, justice, fortitude*, and *temperance:* the reason of which division is founded in this: that, for a man to live virtuously and honestly, it is necessary he know what is fit to be done; which is the business of *prudence.* That he have a constant and firm will to do what he judges best; which will perfect the man, either as it restrains too violent perturbations, the office of *temperance:* or as it spurs and urges on those that are too slow and languid, which is the business of *fortitude:* or, lastly, comparatively, and with regard to human society; which is the object of *justice.*

To these four all the other virtues are referred, either as parts, or as concomitants.

Some ethical writers divide virtue into *benevolence, prudence, fortitude*, and *temperance;* by others it is distinguished into two branches only, *prudence* and *benevolence;* the former attentive to our own interest, and the latter to that of our fellow-creatures, both directed to the increase of happiness, and taking equal concern in the future as in the present: but the division that is now most common, is into duties towards *God*, as piety, reverence, resignation, gratitude, &c.; towards *other men* (relative duties), as justice, charity, fidelity, loyalty,

loyalty, &c.; towards *ourselves*, as chastity, sobriety, temperance, preservation of life, of health, &c.

VIRTUES, in the *Celestial Hierarchy*, the third rank, or choir, of angels, being that in order between *dominations* and *powers*.

To these is attributed the power of working miracles, and of strengthening and reinforcing the inferior angels in the exercise of their functions.

VIRTUES *of Plants*, in the history of *Botany*, are generally understood to be certain qualities, appropriated to every plant, and inherent in its constitution, by which it is rendered effectual in the cure of particular diseases. The discovery of such qualities was, doubtless, at first, in every country, casual, or empirical; and the history or knowledge of them traditionary. Such knowledge, acquired to any considerable extent, rendered its possessor an important personage in human society; and when combined with skill in the discrimination of diseases themselves, completed the character of a physician. Such was the science of Hippocrates and Dioscorides; the former having been best versed in the knowledge of diseases; the latter in a practical acquaintance with their reputed remedies. This kind of practical knowledge makes up the whole history of ancient medicine. How soon hypothetical enquiries, or opinions, may have arisen, it is scarcely possible to learn, or even to conjecture. Among these, the supposed influence of the heavenly bodies upon the properties of plants, particularly with respect to the time when they ought to be gathered in order to be the most effectual, seems one of the most ancient hypotheses. When the imagination was once let loose, and theory took place of experience, mankind were disposed to run headlong into this, like every other superstition or folly. The complete history of such, is buried in the darkness of antiquity; but its traces are abundantly visible in the medical records of every ancient nation, especially of China, Hindoostan, Arabia, and Greece, nor are they quite effaced among the most enlightened people. Into these it is by no means our present purpose to enter.

At that memorable era in the history of mankind, emphatically termed the revival of learning, the first object of learned physicians was to inform themselves of the opinions of the ancients, on every subject connected with their science, and above all, on the Medical Virtues of Plants. No one presumed to have an opinion which was not authorized by a Greek or Latin, or perhaps an Arabian, writer. So that here the science of medicine, philosophically considered, made a complete stand, and became once more traditional and empirical.

We have, under the article ODONTITES, spoken of one method, which was systematically used, to investigate the qualities of plants; a comparison of their outward form with certain parts of the human body, on which they were supposed specifically to act. Some traces of this notion may be found in Dioscorides; in his account of the *Orchis*, for instance; which plant is indeed so remarkable for the figure of its root, that one cannot wonder at any fancies it may have excited, nor that supposed qualities, founded thereon, should have been handed down to our times. The celebrated restorative properties of Salep rest, we believe, on no firmer foundation, whatever may be the effect of the wine, sugar, or aromatics added to make that mucilaginous substance palatable, or whatever nutriment it may, as a mucilage, contain. If however there be, in this instance, some casual coincidence between the shape and the specific virtue of the plant, the same will scarcely be believed to exist between heart-shaped leaves, or roots, and the human heart; or between herbs with capillary stalks, like ferns or mosses, and the hair of our heads. A person raging with the tooth-ache would not twice recur for a cure, to the various kinds of Toothwort, because of their notched roots, though one of them, *Lathræa Squamaria*, be ever so good an imitation of the fore teeth. Yet these, and many other vain imaginations, are found in the elaborate book of Baptista Porta. So far we might take him for an honest enthusiast. But when he purposely delineates the roots of *Doronicum* or *Arnica*, with the precise shape of a scorpion, to prove the plants a cure for its sting; we can scarcely believe he intended to deceive himself, and therefore he must have had some other aim, not worth inquiring into. Few persons will be led by this author, to believe in any connection between the hooked prickles of a Bramble, and the teeth of a Viper, or the scales of a Lily-root, and those of a Fish. We shall detain the reader no longer on this part of our subject.

Chemical analysis has proved absolutely useless to detect the properties of plants. The world is obliged to Geoffroy, Chomel, and their pupils, who with this aim have analysed nearly two thousand different species; because their labours, having led to no discovery whatever, except of their own futility, no man in future will have any inducement to waste his time in this pursuit.

Linnæus was, if we mistake not, the first person who suggested an enquiry into the qualities of plants, on the principle of botanical affinity, or technical characters. That vegetables of one great obvious natural class, such as Grasses, Leguminous or Umbelliferous plants, should have a general agreement with each other, is probable at first sight. Each class may be expected to be throughout salutary or dangerous, and they generally prove so, with certain limitations. The Darnel is almost a solitary instance of any thing pernicious among Grasses; Umbellate plants in a dry soil are aromatic and wholesome; in a wet one, acrid and highly dangerous. The *Convolvulus* genus affords several eminently purgative roots, nor would any rational botanist venture to use them without caution; though the operations of cookery render one of this genus, *C. Batatas*, wholesome and delicious. The acrid qualities of one species of *Euphorbia*, as being a most decidedly marked, and very peculiar, genus, are found in more or less activity, in all. Agreement in the parts of fructification is therefore, with great reason, set forth by the learned author of the sexual system, as the index to a similarity of properties. Thus the *Stellatæ* are diuretic, the *Asperifoliæ* emollient, the *Luridæ* narcotic and dangerous, the *Bicornes* astringent, the *Verticillatæ* fragrant and harmless, the *Compositæ* bitter, greatly meliorated by culture and cookery. All these, though named from various characters, are distinguished by their fructification. The different insertion of parts sometimes indicates a difference of quality, of which the class *Icosandria* is a memorable and often repeated example. The insertion of its *stamens* into the *calyx*, is attended with a wholesome fruit, and the same insertion in other classes, may be safely trusted in that respect. Plants which have a *nectary* distinct from the *petals*, are always to be mistrusted. So are milky plants in general, yet not without exception. A dry soil usually renders plants aromatic and wholesome, and abounds most with such; moisture, or much wet, nourishes virose, acrid, poisonous tribes, of various descriptions. Sweet-smelling and agreeably-flavoured vegetables are, for the most part, wholesome, for it were a sort of treachery in Nature to have made them otherwise. Fetid herbs and nauseous fruits are revolting to our senses, and warn us of danger. Linnæus observes that a pale colour indicates insipidity, at least in the herbage; yellow is a sign of bitterness or acrimony;

mony; red, of acidity or astringency; black, of a noxious quality. Even this last however is overruled by the insertion of the stamens into the calyx; witness *Prunus* and *Ribes*.

Such are a few of the hints given by Linnæus. They are well worthy of consideration, and may be extended or modified by practical observation. Exceptions, of course, will present themselves, but scarcely more than occur in any other department of natural science.

It is hardly necessary to say that the above rules relate exclusively to the human constitution. Some animals feed on what are fatal poisons to others. The Goat and Deer browze on the *Clematis*, which would blister our throat, or even our skin; and delight in the nauseous virulent seed of the Horse Chesnut. Insects thrive on the most bitter or burning milky herbs or shrubs, which no quadruped could taste with impunity. Nature teaches every animal what is salutary to itself, and what is dangerous; but man is capable of reason and science, to make experiments and observations, and to enlarge the sphere of his knowledge by drawing general conclusions.

VIRTUOSO, A man possessed of talents in any of the fine arts is called a virtuoso, but particularly in music, where it usually implies a professor of talents.

Among us, the term seems appropriated to those who apply themselves to some curious and quaint, rather than immediately useful art or study: as antiquaries, collectors of rarities of any kind, microscopical observers, &c.

VIRTZ, in *Geography*, a lake of Russia, in the government of Riga, about forty miles in circumference; 96 miles N.N.E. of Riga.

VIRUCINATES, in *Ancient Geography*, a people of Vindelicia, denominated Rucinates by Hardouin, who is justified in this reading by Ptolemy.

VIRUELA, in *Geography*, a town of Spain, in Aragon; 6 miles from Tarracona.

VIRVESCA. See BIRVIESCA.

VIRULENT, a term applied to any thing that yields a *virus*, that is, a contagious or malignant pus.

The gonorrhœa virulenta is what we popularly call a *clap*.

VIRUNI, in *Ancient Geography*, a people of Germany, placed by Ptolemy with the Teutonari, between the country of the Saxons and that of the Suevi.

VIRUNUM, a town situated in the northern part of Germany, probably belonging to the Viruni, and supposed by Cluvier to be the present Waren, in Mecklenburg.—Also, a town of Norica, or isle of Norica, in the middle of the Danube, upon the route from Aquileia to Lauriacum, between Santicum and Candalica, according to Anton. Itin. In the table of Peutinger it is named Varenum. It is thought that the emperor Claudius established a colony in this place. Cellarius supposes that this is the present Volckmarck, in Carinthia.

VIRUPAKSHA, in *Mythology*, a name of the Hindoo deity *Siva*; which see. It is said to mean *with three eyes*, similar to *Trilokan*; which see. The epithet Sri, or divine, is commonly prefixed to this name. See SRI and SRI-VIRUPAKSHA.

VIS, or VISAY, in *Commerce*, a weight in the East Indies, which is the eighth part of the maund. See MAUND.

VIS, in *Physiology*, a term employed to denote the vital powers: thus, *vis insita* is the contractile power of a muscle, so named because it is inherent in the organization of the part, and not dependent on any other influence: it is equivalent to *vis irritabilis*. *Vis nervea* is that power of contraction which depends on the nerves. *Vis vitæ* is a general expression for the vital power altogether. See LIFE, MUSCLE, and NERVOUS *System*.

VIS, a Latin word, signifying force or power; adopted by physical writers, to express divers kinds of natural powers or faculties. See FORCE.

This is active and passive; the *vis activa* is the power of producing motion; the *vis passiva*, that of receiving or losing it. The *vis activa* is again subdivided into *vis viva* and *vis mortua*.

VIS *Absoluta*, or *absolute force*, is that kind of centripetal force which is measured by the motion that would be generated by it in a given body, at a given distance, and depends on the efficacy of the cause producing it.

VIS *Acceleratrix*, or *accelerating force*, is that centripetal force which produces an accelerated motion, and is proportional to the velocity which it generates in a given time.

This is different at different distances from the same central body; and depends not on the quantity of matter that gravitates, being equal in all sorts of bodies at equal distances from the centre. See ACCELERATION.

VIS *Impressa* is defined by sir Isaac Newton to be the action exercised on any body to change its state, either of rest or moving uniformly in a right line.

This force consists altogether in the action; and has no place in the body after the action has ceased. For the body perseveres in every new state by the *vis inertiæ* alone.

The *vis impressa* may arise from divers causes; as from percussion, pression, and centripetal force.

VIS *Inertiæ*, *power of inactivity*, is defined by sir Isaac Newton to be a power implanted in all matter, by which it resists any change endeavoured to be made in its state, *i. e.* whereby it becomes difficult to alter its state, either of rest or motion.

This power, then, coincides with the *vis resistendi*, power of resisting, by which every body endeavours, as much as it can, to persevere in its own state, whether of rest or uniform rectilinear motion; which power is still proportional to the body, and only differs from the *vis inertiæ* of the mass, in the manner of conceiving it.

Bodies only exert this power in changes brought on their state by some *vis impressa*, force impressed on them. And the exercise of this power is, in different respects, both resistance and impetus; resistance, as the body opposes a force impressed on it to change its state; and impetus, as the same body endeavours to change the state of the resisting obstacle. Phil. Nat. Princ. Math. lib. i.

The *vis inertiæ*, the same great author elsewhere observes, is a passive principle, by which bodies persist in their motion, or rest, receive motion, in proportion to the force impressing it, and resist as much as they are resisted.

For the effect of the *vis inertiæ*, in resisting and retarding the motion of bodies, &c. see RESISTANCE.

VIS *Insita*, or *innate force* of matter, is a power of resisting, by which every body, as much as in it lies, endeavours to persevere in its present state, whether of rest or of moving uniformly forward in a right line.

This force is ever proportional to that body whose force it is, and differs nothing from the *vis inertiæ* but in our manner of conceiving it.

VIS *Centripeta*. See CENTRIPETAL *Force*.

VIS *Centrifuga*. See CENTRIFUGAL *Force*.

VIS *Motrix*, or *moving force*, of a centripetal body, is the tendency of the whole body towards the centre, resulting from the tendency of all the parts, and is proportional to the motion which it generates in a given time, so that the *vis motrix* is to the *vis acceleratrix*, as the motion to the celerity: and as the quantity of motion in a body is estimated by the product of the celerity into the quantity of matter, the

the *vis motrix* arises from the *vis acceleratrix*, multiplied by the quantity of matter.

The followers of Leibnitz use the term *vis motrix* for the force of a body in motion, in the same sense as the Newtonians use the term *vis inertiæ;* this latter they allow to be inherent in a body at rest; but the former, or *vis motrix*, is a force inherent in the same body whilst in motion, which actually carries it from place to place, by acting upon it always with the same intensity in every physical part of the line which it describes. See FORCE and MOTION.

VIS *Viva*, in *Mechanics*, a term used by Leibnitz and his disciples for *force*, (which see,) which they distinguish into two kinds, *vis mortua*, and *vis viva;* understanding by the former any kind of pressure, or an endeavour to move, insufficient to produce actual motion, unless its action on a body be continued for some time, and by the latter, that force or power of acting which resides in a body in motion.

VISAKNA, or SALZBURG, in *Geography*, a town of Transylvania, famous for its salt-works; 4 miles N. of Hermanstadt.

VISANDONE, a town of Italy, in Friuli; 5 miles S.W. of Udina.

VISBECK, or FISCHBECK, a town of Westphalia, in the county of Schauenburg, with an imperial free Lutheran abbey for ladies, on the Weser; 8 miles E. of Rinteln.

VISBURGII, in *Ancient Geography*, a people of Germany, N. of the Hercynian forest. Ptol. According to Cluvier, they are the same people with those placed by Ptolemy in Sarmatia, and named Burgiones. He thinks they inhabited the mountains of Sarmatia and the Vistula, and that from the name of this river they were called Thi-Wisselburges, which the Latins corrupted into Visburgi, and others into Burgiones.

VISCAGO, in *Botany*, from *viscum*, bird-lime, and *ago*, to produce or bear, a name borrowed by Dillenius, in Hort. Elth. 416, from Cæsalpinus and Camerarius, and applied to such species of the old genus of *Lychnis*, as have several cells in the capsule. These come chiefly under SILENE; see that article. The above name alludes to the viscidity of these plants, and is synonimous with their English appellation, Catchfly.

VISCAGO is also used by some pharmaceutic writers to express a mucilage.

VISCARDO, in *Geography*, a sea-port town on the N. coast of Cephalonia, opposite to the island of Teaki, which gives name to a narrow strait that separates the two islands.

VISCARIA, in *Botany*, a word of the same import as VISCAGO; see that article. It was originally applied by Tabernæmontanus to the common Lobel's Catchfly, *Silene Armeria;* and has been retained by Linnæus, as the specific name of the German Catchfly, *Lychnis Viscaria.* He always wrote it with a capital letter, as if it had previously been used for a generic or proper name, which not being the case, it had better have been considered as an adjective, and made *viscata*.

VISCERA, in *Anatomy*, a term originally applied to the bowels or intestines, but now used indiscriminately for the organs contained in any cavity of the body. Thus, the heart, lungs, &c. are called the thoracic viscera; the liver, spleen, pancreas, stomach, and intestines, the abdominal viscera, &c.

The term is formed of *vesci*, to feed; by reason eatables, called in Latin *vesca*, undergo divers preparations in the viscera.

The word is also frequently used singularly, *viscus*, to express some particular part of the entrails, because the word *entrails* has no singular.

The different internal organs, comprised under the general designation of viscera, are described under their respective heads: see HEART, LUNGS, THYMUS, STOMACH, INTESTINES, LIVER, SPLEEN, PANCREAS, EPIPLOON, and GENERATION.

We have only to add, in the present article, an explanation of the references in the plates representing the anatomy of the viscera.

ANATOMY (*Viscera*). *Plate* I.

Fig. 1. is a front view of the chest and abdomen in a newly born child; the sternum and neighbouring part of the ribs, with the corresponding pleuræ, the front of the abdominal parietes and diaphragm, having been cut through and removed.

1. Os hyoides.
2. 2. Portion of the sterno-hyoideus and omo-hyoideus muscles.
3. 3. Portion of the sterno-thyroideus turned back.
4. Thyroid cartilage.
5. 5. Hyo-thyroideus.
6. 6. Thyroid gland.
7. Trachea.
8. 8. Portion of the sterno-cleido-mastoideus.
9. 9. Clavicle.
10. 10. First rib.
11. 11. Ninth rib.
12. Thymus.
13—15. Right lung: 13. Its superior lobe; 14. Middle lobe; 15. Inferior lobe.
16. 17. Left lung: 16. The superior lobe; 17. The inferior lobe.
18. Pericardium.
19. 19. Diaphragm.
20. 21. Liver: 20. The right lobe; 21. The left lobe.
22. Suspensory ligament of the liver.
23. The umbilical vein turned back.
24. The spleen.
25. 26. Great omentum: 25. Its portion lying on the mesocolon; 26. Loose portion.
27. 27. Arch of the colon.
28. Left portion of the colon.
29. The right portion.
30. 30. 30. The jejunum, filled partly with meconium, partly with air.
31. 31. 31. The ileum.
32. Urinary bladder, with its fundus turned forwards.
33. 33. Umbilical artery.
34. Urachus.
35. Internal surface of the peritoneum.
36. 36. Internal jugular vein.
37. 37. Thyroid vein.
38. 38. Subclavian vein.
39. 39. Common carotid artery.
40. 40. Subclavian artery.
41. Œsophagus.

Fig. 2. exhibits the same view as the last, except that the thymus and pericardium have been removed, and the liver turned up towards the right, so as to expose the stomach.

1—4. The heart: 1. Appendix of the right auricle; 2. Pulmonary ventricle; 3. Appendix of the left auricle; 4. Aortic ventricle. (The outline of the heart is marked by a dotted line on the surface of the liver.)
5. Pulmonary artery.

6. Aorta.

6. Aorta.
7. Left fubclavian artery.
8. Left carotid.
9. Arteria innominata.
10. Right carotid.
11. Right fubclavian artery.
12. Superior vena cava.
13. 14. Right internal jugular vein: 13. Portion in the cheft; 14. Portion in the neck.
15. Right fubclavian vein.
16. 17. Left internal jugular vein: 16. Thoracic portion; 17. Cervical portion.
18. Left fubclavian vein.
19—22. Concave or under furface of the liver: 19. Right lobe; 20. Square portion; 21. Left lobe; 22. Lobulus Spigelii, feen through the fmall omentum.
23. Part of the fuperior or convex furface.
24. 24. 24. Thin edge.
25. 25. Thick edge.
26. Umbilical vein cut through and turned back.
27. The pons covering the notch of the umbilical vein.
28. Gall-bladder.
29. Part of the diaphragm.
30. Spleen.
31. Œfophagus entering the ftomach.
32. Œfophagus in the neck.
33. Stomach.
34. Pylorus.
35. Duodenum.
36. 36. 36. Tranfverfe portion of the colon.
37. Right portion of the colon. The other parts are the fame as in the preceding figure.

Anatomy (*Vifcera*). *Plate* II.

Two views from a fubject of the fame age, as that from which the figures of *Plate* I. are taken, to fhew the more deeply feated parts.

Fig. 1. The heart and large veffels only are feen in the cheft, the other parts having been removed. The fmall inteftine is removed from the abdomen, and the arch of the colon is turned upwards.

1. Right or pulmonary ventricle of the heart.
2. Aortic or left ventricle.
3. Appendix of the right auricle.
4. Appendix of the left auricle.
5. Pulmonary artery.
6. Aorta.
7. Arteria innominata.
8. Right carotid.
9. Right fubclavian.
10. Left carotid.
11. Left fubclavian.
12. Inferior vena cava covered by the pericardium.
13. Superior vena cava.
14. Right internal jugular vein.
15. Left internal jugular vein.
16. Trachea.
17. 17. Thyroid gland.
18. Thyroid cartilage.
19. 19. Thyro-hyoideus.
20. 20. Sterno-thyroideus detached and turned back. (The fterno-hyoideus is removed.)
21. 21. Part of the fterno-cleido-maftoideus.
22. 22. Clavicle.
23. 23. Firft rib.
24. 24. Second rib.
25. 25. Cut edge of the diaphragm.
26. Arch of the colon.
27. Right portion of the colon.
28. Part of the left colon.
29. Tranfverfe mefocolon.
30. Stomach feen obfcurely through the mefocolon.
31. Left or great extremity of the ftomach.
32. Spleen.
33. Right kidney.
34. Right portion of the colon.
35. Cæcum and appendix vermiformis.
36. End of the ileum.
37. Commencement of the jejunum.
38. Mefentery.
39. 39. Sigmoid flexure of the colon.
40. Its mefocolon.
41. Rectum.
42. Urinary bladder turned forwards and downwards.
43. 43. Umbilical arteries.
44. Urachus.

Fig. 2. All the thoracic vifcera are removed; alfo the diaphragm, and the fmall inteftine, excepting the duodenum. The peritoneum is cleared from the kidney and larger veffels.

1. 1. Thyroid gland.
2. 2. Portion of the fterno-cleido-maftoideus.
3. 3. Sterno-thyroideus detached and turned back. (The fterno-hyoideus is removed.)
4. 4. Thyro-hyoideus.
5. Thyroid cartilage.
6. 6. Clavicle.
7. Trachea.
8. 8. Œfophagus; its longitudinal mufcular fibres are expofed.
9—11. Stomach moderately diftended.
9. The cardia.
10. The blind pouch.
11. Pylorus.
12—14. Duodenum: 12. The firft curvature; 13. The fecond; 14. The third.
15. Pancreas.
16. Spleen.
17. Right kidney.
18. Left kidney.
19. Right renal capfule.
20. Portion of diaphragm.
21. Arch of the aorta with its three great branches. See *fig.* 1. N° 7. 10. 11.
22. Canalis arteriofus.
23. Defcending thoracic aorta.
24. Defcending abdominal aorta.
25. Right iliac artery.
26. Left iliac artery.
30. 30. Spermatic artery and vein.
31. 31. Ureter.
32. The cut orifice of the rectum.
33. Urinary bladder turned down.
34. 34. Umbilical artery.
35. Urachus.
36. 36. Firft rib.

Anatomy (*Vifcera*). *Plate* III.

Views of the thoracic and abdominal vifcera from behind.

Fig. 1. The mufcles of the neck and back, the back of

of the ribs, and the spinous processes of the vertebræ, are removed.

1. 1. First rib.
2. 2. Eleventh rib.
3. 3. Twelfth rib, with the diaphragm and abdominal muscles still attached. The ribs are gently drawn aside, to expose the lungs
4. 4. Sixth cervical vertebra.
5. 5. Sacrum.
6. 6. Gluteus maximus.
7. 7. Gluteus medius.
8. 8. 8. The vertebral theca of the dura mater.
9. The same, covering the cauda equina.
10. 10. The scapulæ a little drawn aside.
11. 12. The left lung: 11. Superior lobe; 12. Inferior lobe.
13—15. Right lung: 13. Superior lobe; 14. Middle lobe; 15. Inferior lobe.
16—18. Diaphragm: 16. Covering the left lobe of the liver, stomach, and spleen; 17. Covering the right lobe; 18. 18. Attached to the twelfth rib.
19. Right renal capsule.
20. Left kidney.
21. Right kidney.
22. Inferior surface of the right lobe of the liver.
23. Left part of the colon.
24. Sigmoid flexure of the colon.
25. Portion of the ileum.

Fig. 2. The vertebral column, together with part of the os innominatum, is removed.

1. 1. First rib.
2. 2. Eleventh rib.
3. 3. Scapula drawn aside.
4. 4. Internal jugular vein.
5. 5. Common carotid artery.
6. 6. Subclavian artery.
7. 7. Inferior thyroid artery.
8. Part of the aortic arch.
9. 10. Descending aorta: 9. Thoracic; 10. Abdominal.
11. Division of the aorta into the common iliacs.
12. Middle sacral artery. The intercostal, renal, and lumbar arteries are not numbered.
13. Vena azygos cut off.
14. Inferior vena cava.
15. Left renal vein.
16. Right renal vein, double in this subject.
17. Union of the iliac veins to form the inferior cava.
18. 18. Par vagum.
19. 19. Thyroid gland; the blood-vessels are drawn aside by a hook on the left side.
20. Lower part of the pharynx.
21. 21. Thyroid cartilage.
22. Œsophagus.
23. Œsophagus entering the stomach.
24. Part of the stomach.
26. 27. Superior and inferior lobes of the left lung.
28. 29. 30. Superior, middle, and inferior lobes of the right lung.
31. 31. 31. Diaphragm.
32. 32. Abdominal muscles.
33. Spleen.
34. Part of the pancreas.
35—37. Left and right lobes, and processus caudatus of the liver.
38. Left renal capsule.
39. Right renal capsule.
40. Left kidney.
41. Right kidney.
42. Left ureter.
43. Right ureter.
44. 44. Spermatic vessels.
45. Left portion of the colon.
46. Sigmoid flexure.
47. Part of the jejunum seen through the peritoneum.
48. Rectum.
49. Portion of the ileum.

Anatomy (*Viscera*). *Plate* IV.

Four views of the heart, two of which represent its external appearance; the other two, its cavities laid open.

Fig. 1. The convex or superior surface.

1. Right auricle.
2. Its appendix.
3. Left auricle.
4. Its appendix.
5. 6. Left pulmonary veins.
7. Superior vena cava.
8. Place from which the pulmonary artery has been cut off.
9. Aorta.
10. Arteria innominata.
11. Left carotid artery.
12. Left subclavian artery.
13. Right or inferior coronary artery.
14. Left or superior coronary artery.
16. Anterior branch of the great coronary vein.
17. A small vein of the heart opening into the right auricle.

Fig. 3. The heart and its blood-vessels seen on the inferior or flat surface.

1. Right auricle.
2. Inferior vena cava cut off and tied.
3. Superior vena cava.
4. Left auricle.
5. Its appendix.
6. 7. Right pulmonary veins.
8. One of the left pulmonary veins.
9. Right coronary artery.
10. Circumflex branch of the left coronary artery.
12. Great posterior branch of the great coronary vein.
13. 14. Smaller posterior branches.
15. Small branch from the right auricle.
16. Trunk of the great coronary vein ending in the right auricle.

Fig. 3. The left side of the heart exposed.

1—5. Left auricle.
4. The appendix.
5. Septum auricularum.
6—12. Left ventricle.
6. 6. Auriculo-ventricular opening.
7. 8. 8. Mitral valve.
7. Superior or larger portion.
8. 8. Inferior or smaller portion cut through.
9. 9. 9. Fleshy column, connected to the valve.
10. 10. Reticulated muscular columns.
11. Ventricular septum.
12. Tube placed in the mouth of the aorta.

Fig. 4. The left ventricle and beginning of the aorta laid open.

1. 1. Part of the right ventricle exposed.

2. 2. The

2. 2. The septum ventriculorum divided to expose the left ventricle.
3. Cavity of the left ventricle.
4. Part of the mitral valve.
5. 6. 7. Sigmoid or semi-lunar valves.
8. 8. 8. Corpora sesamoidea Arantii.
9. 10. Orifices of the coronary arteries.
11. Cavity of the aorta.
12. 13. 14. Orifices of its three great superior branches.

VISCERA, *Wounds of the*. See WOUNDS.

VISCERALIA, a term used by physicians to denote such medicines as impart strength and firmness to the sanguineous viscera, such as the liver, spleen, &c.

VISCERATIONES, among the Romans, a feast consisting of the entrails of animals, given to the people at the burial of great men in Rome.

VISCHAR, in *Geography*, a town of Persia, in the province of Irak; 20 miles S.S.E. of Hamadan.

VISCHER'S ISLAND, a small island in the Pacific ocean, near the E. coast of Morty. N. lat. 2° 21′. E. long. 128° 39′.

VISCHERA, a river of Russia, which runs into the Kama, 16 miles N. of Solikamsk, in the government of Perm.—Also, a river of Russia, which runs into the Vitchegda, 20 miles E. of Nebdanskoi, in the province of Ustiug.

VISCHMA, a town of Russia, in the government of Tobolsk; 268 miles S.W. of Tobolsk. N. lat. 62° 36′. E. long. 60° 14′.

VISCHNEIVOLOGOK, a town of Russia, in the government of Tver, on a canal, which forms a communication between the Msta and the Tvertza; 60 miles N.W. of Tver. This place is remarkable for the extensive canals on which the great inland navigation of Russia is carried on. The communication just mentioned is by a navigable canal of at least 500 versts, uniting the Caspian with the Baltic. N. lat. 57° 8′. E. long. 34° 54′.

VISCIDITY, or VISCOSITY, the quality of something that is *viscid*, or *viscous*, *i. e.* glutinous and sticky, like bird-lime; which the Latins call by the name *viscus*.

Viscid bodies are those which consist of parts so implicated within each other, that they resist, a long time, a complete separation, and rather give way to the violence done them by stretching, or extending each way.

The too great viscidity of foods has very ill effects; thus meals, or farinæ not fermented, jellies, &c. of animals, tough cheese, or curd too much pressed, produce a weight, or oppression in the stomach; wind, yawnings, crudities, obstructions of the minuter vessels in the intestines, &c. Hence an inactivity of the intestines themselves, a swelling of the abdomen; and hence a viscidity of the blood, from the reunion of the viscid particles; obstructions of the glands, paleness, coldness, tremors, &c.

VISCO, in *Geography*, a village of Italy, in Friuli; 2 miles E. of Palma Nuova.

VISCONTI, CATERINA, of Milan, in *Biography*, an opera singer of great reputation in her day, arrived here in 1742, at the beginning of lord Middlesex's regency, and performed with Monticelli in the operas of Galuppi and Lampugnani, &c. till the year 1745, when the breaking out of the rebellion occasioned an interdict against the whole opera band, vocal and instrumental.

The Visconti had a shrill flexible voice, and could run divisions faster than the violins of those times could follow her. And *bravura* or execution was then so new, that she pleased more in rapid songs than she could have done in those that required high colouring and pathos, if she had been possessed of either. She was so fat, that her age being the subject of conversation in a company where lord Chesterfield was present; when a gentleman, who supposed her to be much younger than the rest, said she was but two-and-twenty; his lordship, interrupting him, said, "you mean *stone*, sir, not years." She was engaged a second time in the Haymarket for the season of 1753 and 1754; but having been heard in her better day, her talents were pronounced on the decline, which occasioned a declension in the public favour. And at the end of a heavy season she gave way to Mingotti, who, in the autumn of 1754, revived the favour of our lyric theatre, and for two or three seasons gave it a considerable degree of splendour.

VISCOUNT. See VICOUNT.

VISCUM, in *Botany*, so called by Pliny, and by some Latin writers *Viscus*, derives its name from the Greek ἰξος, altered by the Æolians into βισκος. The transition is easy enough to the Latin, though scarcely to the English appellation of this plant, Misletoe, so famous in the history of our superstitious and barbarous ancestors. We have hinted, under the biographical article SIBTHORP, that this learned traveller and botanist, though he reckoned our *V. album*, still called ἰξιὰ, to be the ἰξος of Dioscorides, nevertheless suspected latterly that the *Loranthus europæus* might have been considered by the ancients as a more genuine or perfect kind. The latter grows in Arcadia on the Oak; our *Viscum album* on the Silver Fir only. Hence perhaps the Druids, not knowing the *Loranthus*, or true Misletoe of the Oak, attached such importance to the particular plants of the *Viscum* found on this tree; in which over-curious persons, who see with the eyes of tradition and prejudice, rather than with their own natural organs, still affect to perceive something peculiar. We submit this point to the consideration of the learned, not being aware of its having ever been suggested by any one before.—Linn. Gen. 517. Schreb. 680. Willd. Sp. Pl. v. 4. 737. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 1074. Prodr. Fl. Græc. Sibth. v. 2. 256. Ait. Hort. Kew. v. 5. 371. Swartz Ind. Occ. 266. Pursh 114. Juss. 212. Tourn. t. 380. Lamarck Dict. v. 3. 55. Illustr. t. 807. Gærtn. t. 27.—Class and order, *Dioecia Tetrandria*. Nat. Ord. *Aggregatæ*, Linn. *Caprifolia*, Juss.

Gen. Ch. Male, *Cal.* none. *Cor.* Petals four, calyx-like, ovate, equal, dilated and connected at the base. *Stam.* Filaments none; anthers four, oblong, pointed, dotted, each attached to the disk of one of the petals.

Female, *Cal.* a slight four-cleft border. *Cor.* Petals four, superior, small, ovate, sessile, calyx-like, deciduous. *Pist.* Germen inferior, oblong, three-sided, crowned with the obsolete calyx; style none; stigma obtuse, scarcely notched. *Peric.* Berry globose, smooth, of one cell. *Seed* solitary, heart-shaped, compressed, obtuse, fleshy, lodged in viscid pulp.

Eff. Ch. Male, Calyx none. Petals four, calyx-like, dilated and cohering at their base. Anthers sessile upon the petals.

Female, Calyx a slight border. Petals four, calyx-like, dilated at the base. Style none. Berry inferior, with one seed.

Obs. The analogy, or natural affinity, of this genus has always induced us to follow Jussieu, rather than Linnæus, in denominating the principal, or only, integument of its flowers a *corolla*, rather than a *calyx*. All the known species are parasitical, and though probably to be cultivated, if sown on the branches or stems of particular trees, like our only English one, provided we could have their berries fresh, none of them has yet been introduced into any garden, except that species. Their habit is rigid and coriaceous;

leaves,

leaves, if present, simple, undivided, entire, on short stalks, opposite as well as the branches. *Flowers* in axillary heads or spikes, sessile or stalked, generally greenish and inconspicuous. The species are by no means well understood. We follow Willdenow, who has given the best account of them.

1. V. *album*. Common Misletoe. Linn. Sp. Pl. 1451. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 1470. Mill. Illustr. t. 87. Woodv. Suppl. t. 270. (Viscum; Matth. Valgr. v. 2. 161. Camer. Epit. 555. Ger. Em. 1350.)—Leaves lanceolate, obtuse, ribless. Stem forked. Flowers five together, in terminal, sessile heads.—Found throughout Europe, on the branches of old apple-trees, hawthorns, lime-trees, oaks, Scotch fir, or the silver fir, as above mentioned, flowering in the spring, and ripening its large white *berries* late in autumn. The plant forms large, smooth, perennial, bushy tufts, of a pale green, becoming yellowish, and therefore most conspicuous, in winter. The *stems* are round, repeatedly forked. *Leaves* about an inch, or inch and half, long, thick and leathery, smooth, tapering down into short thick *footstalks*. *Flowers* crowded, yellowish. *Anthers* singularly and beautifully dotted, almost as large as the *petals* on which they lie. The sweetish viscid pulp of the pearly *berries* makes an indifferent sort of bird-lime. This Misletoe, the golden bough of Virgil, which was Æneas's passport to the infernal regions, and the sacred plant of the Druids, still retains some respect in our churches and kitchens at Christmas, intermixed with Holly, which last, if we mistake not, is Virgil's *Acanthus*.

2. V. *macrostachyon*. Long-spiked Misletoe. Jacq. Coll. v. 2. 109. t. 5. f. 3. Willd. n. 2.—Leaves linear-lanceolate, obtuse, ribless. Spikes axillary, slender, many times longer than the leaves. Flowers remote.—Gathered by Jacquin on trees in Martinico. *Branches* and *leaves* smooth, not unlike the foregoing, but the long, slender, articulated *spikes* abundantly distinguish this species. The *flowers* are either opposite, or solitary, having but three *petals*, at least the female ones, according to Jacquin.

3. V. *orientale*. East Indian Misletoe. Willd. n. 3.—Leaves elliptic-oblong, obtuse, three-ribbed; tapering at the base. Stalks axillary, aggregate, about three-flowered. —Native of the East Indies. We have specimens from the author, as well as from the Rev. Dr. Rottler. The *branches* are angular when dry. *Leaves* an inch or more in length, and full half as broad, on short stalks. *Flowers* either solitary or three together, on very short stalks, as well as crowded into a sort of axillary whorls. *Berries* red. *Willdenow*.

4. V. *pauciflorum*. Hoary Cape Misletoe. Linn. Suppl. 426. Thunb. Prodr. 31. Willd. n. 4.—"Leaves oblong, obtuse, three-ribbed, hoary, smooth; tapering at the base. Flowers axillary, solitary."—Gathered by Thunberg, at the Cape of Good Hope. The plant is described as hoary, though not downy. The ribs do not extend beyond the middle of the *leaf*, and escaped the observation of the younger Linnæus. We have seen no specimen.

5. V. *rubrum*. Red Misletoe. Linn. Sp. Pl. 1451. Willd. n. 5. ("V. foliis longioribus, baccis rubris; Catesb. Car. v. 2. t. 81.")—"Leaves obovato-lanceolate, obtuse. Spikes axillary, whorled."—Found upon trees in Carolina. Catesby alone appears to have seen this species.

6. V. *purpureum*. Purple Misletoe. Linn. Sp. Pl. 1451. Willd. n. 6. ("V. foliis latioribus, baccis purpureis, pediculis insidentibus; Catesb. Car. v. 2. t. 95.")—Leaves obovate, obtuse, obscurely three-ribbed. Spikes axillary, shorter than the leaves. Flowers opposite.—Native of Carolina. *Berries* purple.

7. V. *buxifolium*. Box-leaved White Misletoe. Willd. n. 7. (V. purpureum β; Linn. Sp. Pl. 1451. V. baccis niveis racemosis, foliis buxi luteis; Plum. Ic. 256. t. 258. f. 3.)—Leaves obovate, obtuse, single-ribbed. Spikes axillary, nearly the length of the leaves. Flowers opposite.—Native of trees in the West Indies. *Berries* white. We suspect this may be the first *Viscum* in Browne's Jamaica, p. 356, which he mistook for the *verticillatum* of Linnæus, a widely different plant. But Browne's specimen has occasionally traces of three ribs in the *leaves*, and he has confounded with it the *flavens* of Swartz.

8. V. *myrtilloides*. Bilberry Misletoe. Willd. n. 8.—Leaves obovate, obtuse, five-ribbed. Spikes solitary, axillary. Flowers whorled.—Native of trees in Martinico. *Leaves* an inch long, coriaceous, with five ribs, the lateral ones least conspicuous. *Spikes* opposite, rather longer than the footstalks. *Willdenow*. We have West Indian specimens answering to these characters, except that the *leaves* are three inches long, and rather elliptic-lanceolate than obovate.

9. V. *rotundifolium*. Round-leaved Cape Misletoe. Linn. Suppl. 426. Thunb. Prodr. 31. Willd. n. 9.—Leaves nearly orbicular, acute, ribless. Flowers somewhat whorled. —Found by Thunberg on trees at the Cape of Good Hope. Willdenow says the *flowers* are either solitary, on simple, aggregate, axillary stalks; or many together, on solitary stalks.

10. V. *antarcticum*. Antarctic Misletoe. Forst. Prodr. 70. Willd. n. 10.—"Leaves oblong, tapering at each end, obtuse, ribless. Clusters terminal, of about five flowers." —Native of trees in New Zeeland.

11. V. *capense*. Naked Cape Misletoe. Linn. Suppl. 426, excluding the synonym. Willd. n. 11. Thunb. Prodr. 31. —Stem leafless, obscurely quadrangular, roughish, rugose. Flowers whorled, sessile.—Gathered at the Cape of Good Hope by Dr. Sparrmann. The *stem* is much branched, jointed, roughish to the touch, each joint crowned with two scales, like a *Salicornia*. *Leaves* none. *Anthers* two or four, dotted with minute excavations. *Berries* opposite, sometimes three together, sessile, crowned with a small, angular, hardly four-cleft, *calyx*.

12. V. *vaginatum*. Sheathed Misletoe. Willd. n. 12.—"Stem leafless, quadrangular. Branches compressed, semicylindrical. Joints sheathing."—Gathered by Humboldt and Bonpland, on trees on the mountains of Mexico. *Stem* round below, angular upwards. *Joints* each crowned with a tubular permanent sheath. *Leaves* none. *Berries* in the bosom of the sheaths, opposite, solitary. *Willdenow*.

13. V. *opuntioides*. Wedge-jointed Misletoe. Linn. Sp. Pl. 1452. Willd. n. 13; excluding Plumier's synonym. (V. opuntioides, ramulis compressis; Sloane Jam. v. 2. 93. t. 201. f. 1.)—Stem proliferous, much branched, leafless. Joints wedge-shaped, furrowed, compressed.—Native of trees in Jamaica, and the isle of Bourbon. The flat *joints* at once distinguish this species. Each *joint* is an inch or inch and half long, of a yellowish-green. "*Flowers* small, terminating each joint, in pairs. *Berries* white, resembling our English Misletoe." *Sloane*. Plumier's t. 258. f. 1, must surely be *Cactus pendulus*, Ait. Hort. Kew. v. 3. 178, which is *Cassytha baccifera* of Solander, in Mill. Illustr. t. 29.

14. V. *obscurum*. Elliptical Cape Misletoe. Thunb. Prodr. 31. Willd. n. 14.—"Leaves elliptical, smooth. Stem shrubby."—Gathered at the Cape of Good Hope, on trees, by Thunberg. Nobody else appears to have seen it.

15. V. *flavens*. Yellowish Misletoe. Swartz Ind. Occ. 266. Willd. n. 15. Pursh n. 1? (V. aliud racemosum, foliis

foliis latiffimis; Plum. Ic. 256. t. 258. f. 4. V. racemosum; Aubl. Guian. v. 2. 895.)—Leaves ovate, five-ribbed, veiny. Spikes axillary, from one to four at each fide. Flowers whorled.—Found on trees in the Weft Indies, efpecially near the fea. Two feet high, with round, livid, roughifh *branches*. *Leaves* two inches or more in length, bluntifh, of a livid hue. *Spikes* ftalked, fometimes folitary.

16. V. *latifolium*. Broad-leaved Miftletoe. Swartz Ind. Occ. 268. Willd. n. 16.—Leaves roundifh-ovate, acute, flat, obfcurely veined. Spikes axillary, ftalked, folitary or in pairs.—On trees in Jamaica. Two feet high, fmooth. *Leaves* contracted at each end, brownifh-green, on very fhort ftalks. *Flowers* minute. *Berries* oblong.

17. V. *verticillatum*. Whorled Miftletoe. Linn. Sp. Pl. 1452. Willd. n. 17; excluding the fynonyms of Browne and Plumier. (V. ramulis et foliis longis, denfiffimis, ftriatis et radiatis; Sloane Jam. v. 2. 93. t. 201. f. 2.)—Ultimate branches aggregate, imperfectly whorled, toothed at the end.—Native of Jamaica, where it hangs from the branches of trees. The main *ftem* is divided, angular, ftriated, fmooth, befet here and there with whorls of fimple fpreading *branches*, an inch and half or two inches long, deftitute of *leaves*, tipped with a few fcales. Nothing is known of the fructification, fo the genus is very doubtful. It may turn out a *Cactus*, or at leaft of the fame genus as *C. pendulus* above-mentioned under n. 13. What we here defcribe is, however, the plant intended by Linnæus, though he has confounded with it one altogether different, and has thence perverted the fpecific character.

18. V. *capitellatum*. Capitate Miftletoe.—Leaves wedge-fhaped, concave, obtufe. Berries capitate, on axillary ftalks.—Gathered in Ceylon by Koenig, who fent fpecimens to Linnæus, but the plant has remained hitherto undefcribed, though certainly very diftinct. The *ftems* are three inches high, branched, roughifh to the touch. *Leaves* an inch long at moft, fmooth, flefhy. *Flower-ftalks* rather fhorter, crowned with two thick *bracteas* under the little head of four or five *flowers*. *Berries* oval, crowned with a blunt *calyx*.

Willdenow rightly obferves that *V. terreftre*, Linn. Sp. Pl. 1452, is no other than *Lyfimachia ftricta*, Willd. Sp. Pl. 818. Ait. Hort. Kew. v. 1. 314. (L. bulbifera; Curt. Mag. t. 104.)—Kalm gathered it in Philadelphia, and whether the miftake were his own, or his great preceptor's, it is one of the moft reprehenfible that ever was made.

Several fpecies of *Vifcum* probably are ftill undefcribed among the botanical treafures of the Weft, and perhaps Eaft, Indies.

Viscum, in *Gardening*, furnifhes a plant of the under-fhrub, evergreen, curious, parafitic kind, of which the fort made ufe of is, the white-berried or common miftletoe (V. album).

It has a woody branchy growth and yellowifh-green appearance, producing white tranfparent berries of a confiderable fize, which ripen themfelves in the winter.

It is a remarkable plant, as not growing in the earth or foil, but upon the trunks or branches of other plants, moftly on thofe of the foft-wooded tree forts, being often found in woods and orchards, on the afh, the hazel, the maple, the crab, and the apple-tree.

Method of Culture.—It is for the moft part increafed by the feeds which are accidentally difperfed and depofited upon fome parts of the trees by means of birds, commonly taking root and fixing themfelves on the under fides of the boughs or branches, to which parts they have been wafhed by the rains or in other ways, being kept in fuch fituations until they ftrike root, or plant their radical fibres in the bark between it and the wood, by their foft glutinous quality; the young plants growing downwards in a pendulous manner. The plants may alfo be propagated in garden or orchard plantations, by procuring fome fully ripened berries or feeds in the winter, and fticking or rubbing them on the fmooth parts of the under fides of the branches of fome of the above kinds of trees, where they will grow as already noticed. The outer bark, in fome cafes, is cut or rubbed off in the part before this is done, in order to make it more certain.

The want of fuccefs, in particular inftances, is to be afcribed to the defective fecundation of the plants from which the berries or feeds were taken which are employed. They fhould of courfe always be gathered from plants where different forts grow together.

They are chiefly grown for curiofity; but fometimes for medicinal purpofes.

Viscum is alfo ufed for bird-lime. This was efteemed a poifon among the ancient Greeks, and is feldom omitted under the clafs of deleterious things enumerated in their writings.

It is called by thefe authors *ixias*; but this word has occafioned great errors in late writers, the word ixias having been applied to the white chamæleon thiftle, not becaufe of any poifonous quality it had, for they all declare it to be innocent, but becaufe of its yielding a vifcous or clammy juice. The black chamæleon thiftle was always efteemed poifonous among them; and hence fome have fuppofed the word ixias to be applied to that, and the poifon ixias, mentioned by the Greeks, to be the root of that plant. Paulus Ægineta, indeed, feems to have underftood it fo, the poifon ixias being by him placed among the roots; but Galen, who calls it a flow poifon, and fays that it kills by ftopping up and gluing together the inteftines, plainly enough means bird-lime, not the root of any plant.

Viscum *Caryophylloides*, a name given by fir Hans Sloane, and many other authors, to a genus of plants of a very peculiar kind.

They are called *vifcum*, from their growing upon other trees, in the manner that the miftletoe does with us; and *caryophylloides*, from their leaves, in fome degree, refembling thofe of our pinks or carnations; but the plant itfelf, in all its fpecies, is wholly different, both from the miftletoe and pink, in all other refpects.

The feveral fpecies of thefe plants differ greatly alfo from one another; the moft fragrant fpecies in Jamaica is a very large one, called by the common people the wild pine. See the defcription of it in Phil. Tranf. N° 252. p. 114.

VISCUS, and Viscosity. See Viscera and Viscidity.

VISEGLIA, in *Geography*. See Biseglia.

VISENTIUM, or Visentum, in *Ancient Geography*, a town of Italy, in Etruria, upon the weftern bank of the lake Thrafimené. Pliny fuggefts that this town belonged to the Vifentini who inhabited the vicinity of the Vulcinian lake: it is the prefent Bifentio.

VISET, in *Geography*, a town of France, in the department of the Ourthe, fituated on the E. fide of the Meufe. It was furrounded with walls in the year 1338, by Adolphus de la Mark, bifhop of Liege. John de Heinfberg, the fifty-fecond bifhop, granted it many privileges, in the year 1429; among others, the liberty of choofing their own magiftrates; 6 miles S. of Maeftricht.

VISEU, a town of Portugal, in the province of Beira. This town was founded by the Romans, and by them called "Vifontium." It is the fee of a bifhop, contains three parifh churches, an hofpital, and three convents. In 1027, Alphonfo V. king of Leon, was killed by an arrow before this

this town, as he attempted to take it from the Moors; 27 miles S. of Lamego. N. lat. 40° 45'. W. long. 7° 46'.

VISHIANARY, a town of Hindoostan, in Tinevelly; 18 miles S.S.E. of Palamcotta.

VISHNU, in *Mythology*, is one of the chief deities of the Hindoo trimurti or triad. He is reckoned the second person of this mysterious unity, being a personification of the *preserving* power of the deity. On the whole, Vishnu may be called the chief of the Hindoo gods; as either in himself, or through his consort, or active energy, Lakshmi, or in his various incarnations, he is, perhaps, the god most extensively worshipped: if the numerous sects that indirectly adore him be included, he certainly is. Like the gods and goddesses of other polytheistic people, all the deities of the Hindoo Pantheon are resolvable ultimately into one; that one is the sun, and he, the Hindoo theologians affirm, is merely a symbol of that "infinitely greater light which alone can irradiate our intellects." This esoteric doctrine is of course unknown to the multitude who address and adore Vishnu, as well as the other deities, in the grossness of idolatrous superstition.

Under the article SIVA it is shewn that Vishnu, in a strictly mythological view, is the *preserving* attribute: he represents also the *wisdom* of the deity, as Brahm does his *power*, and Siva his *justice*. Extending our view, we find that Vishnu metaphysically is a personification of *space*; *matter* and *time* being assignable to his coeternal associates in the Hindoo triad. In physics, Vishnu is *water*, or the humid principle generally: thus he is the *air*; and in a degree of relationship less intimate, he is the *earth*. He is also *time*; and, as before said, the *sun*. See LAKSHMI, the name of the sakti, or consort of Vishnu; SARASWATI, the consort of the *creative* Brahma; and PARVATI, the active energy of the *destroying* Siva, for farther particulars of this *preserving* attribute of the inseparable Hindoo triad. These female divinities, which we indiscriminately call the active energy, or power, or consort of their respective lords, are generally termed their *Sakti*; which see. See also MATRI.

As well as wives, or active helpmates, the Hindoo gods have severally *vehicles* assigned them. These are termed *Vahan*; which see. Vishnu, the Jove of India, has his eagle, like his brother of Greece and Rome. The Hindoo bird is named Garuda and Superna. Under the latter word an account of him will be found.

The whole race of Hindoos may be theologically comprehended under the two denominations of *Saivas* and *Vaishnavas*, or worshippers of Siva and Vishnu; either directly of the god himself, or of his sakti; or indirectly of a symbol, or through the intervention of an incarnation. This, however, opens a door to diversity and schism. Under the article SECTS *of Hindoos*, we have endeavoured to class them in a triple arrangement, of *theological*, *civil*, and *philosophical* sectarists. To that article, to SAIVA, VAISHNAVA, and PHILOSOPHY *of the Hindoos*, with others therein referred to, connected with and farther explaining them, we beg to refer the reader inquisitive on points relating to this branch of the mythology of the Hindoos. See also the Hindoo Pantheon.

Representations of Vishnu are very common in all parts of India; in metallic casts, in carvings in wood, stone, or ivory, and in pictures. See the plates of the work just named. When in his own person, he is depicted young and handsome; sometimes two, but commonly four-handed. In his hands are usually seen a club or mace, called gada, a shell or shank, a lotos or padma, and a discus or quoit, called chakra or vajra.

The chakra is a discus or quoit, with a hole in its centre, on which Vishnu is fabled to turn it round his fore-finger so vehemently, that irresistible fire flames from its periphery. It is said to be a missile still used; but whatever mythological mischief may have ensued from its effects, it does not seem capable of producing much sent from a mortal finger. With the Hindoos now, as with the Egyptians of old, this is a very mysterious symbol; the word in Sanscrit means a *wheel*, or something rotatory; and has a like meaning in several spoken dialects of India. *Chakra-varti*, or the Chakra-whirler, is a name of Vishnu, and is sometimes given to other deities and mythological heroes.

The notion of incarnations of their deities is very common among the Hindoos. This terrestrial manifestation they call *avatara*, meaning a *descent*. The avataras of Vishnu have been very numerous; but ten of them are of great celebrity; and the histories of them form the principal subject of several of the sacred poems called *Purana* (which see), and of a great many books in all the languages of the East. We subjoin the names of these ten descents, or *dasavatara*, as they are called in Sanscrit; with some incidental remarks in addition to what we have offered under several of their names. 1. Matsyavatara. This, as the name implies, was a descent in the form of a *fish*; and is represented by a figure of Vishnu, half man half fish; reminding us strongly of the pisciform god of the Assyrians; "sea-monster, Dagon named, upwards man and downwards fish," as well described by Milton. This incarnation and the next are supposed to have allusion to the flood, and representations of half man half fish to Noah. 2. Kurmavatara, or the descent in the form of a *tortoise*. 3. Varahavatara, in the form of a *boar*. 4. Narasingha, or *man-lion*. 5. Vamana, or the *dwarf*. 6. Parasu Rama, a hero so named. 7. Rama, surnamed Chandra. 8. Krishna. 9. Boodh or Budha, or Sakya. 10. Kalki is the last, and is yet to come, when Vishnu will appear mounted on a white horse; and, as mentioned under the article KALKI, end the present iron or kali age, and renovate the creation with an era of purity, called Satya or Sati. See KALI and SUTTEE.

These are the chief of the descents of Vishnu, called pre-eminently *dasavatara*. The reader will see them very ingeniously discussed in Maurice's Indian Antiquities and Ancient History of India.

Besides these grand incarnations, Vishnu has descended in various places and times, usually accompanied by his sakti or consort Lakshmi, also incarnated for that purpose; sometimes retaining her own name and sometimes taking another.

In the spirit of Grecian mythology, these avataras, as the Hindoos more decorously describe them, would appear as the *sons* of Jove. But we have not convenience to pursue, in this place, these analogies of eastern and western fable.

Vishnu, like Siva, and others of the Hindoo deities, has many names. He is said to have a thousand; but this may mean merely a great many. They are strung together in a sort of metrical arrangement, and are mentally recited in some species of worship; the votary sometimes holding in his hand a rosary, and dropping a bead as each name and the excited idea occur: to aid abstraction, the hand and rosary are put into a bag. This silent adoration is called *jap*; which see. Among the names of Vishnu are the following: *Janardana*, said to mean the devourer or absorber of souls. Vishnu being the sun, this may have some solar allusion: otherwise we do not see its applicability to the *preserving* energy. *Heri*, a name also of Krishna, who is, indeed, by sectaries, identified with Vishnu. Heriprya, meaning beloved of Heri, is a name of Lakshmi. In other avataras, a *portion* only of his essence is said to have been incarnated; but in that of Krishna the whole deity, in all his plenitude of potentiality. *Bhagavan*, alluding to the lord of nature:

Bhaga

Bhaga and Bharga are names of Siva, of like alluſion. *Padmanabha*, meaning lord of Padma; the latter being a name of Lakſhmi, and of the lotos, the appropriate ſymbol of a deity who is a perſonification of the humid principle. Lakſhmi is the queen of beauty, and the lotos is the proverbial type of female lovelineſs. (See LOTOS and PADMA.) *Prabhu:* this name may allude to Viſhnu's *ſolar* godhead; for a word of the ſame root, *Prabha*, implies *brightneſs, ſplendour, effulgence;* and is a name of the conſort of the ſun. See PRABHA and SURYA; in which laſt article, being the name of the Hindoo Phœbus, are many particulars explanatory of the ſolar Viſhnu. *Narayana*, meaning moving on or abiding in the waters, is a name applied to Viſhnu by his ſectaries, and to other deities by theirs. (See SECTS *of Hindoos*.) Although Viſhnu hath this *aqueous* name and character, he does not agree with the Neptune of the Weſt ſo intimately as Siva. (See SIVA, TRISULA, and VARUNA.) *Sri* is a name or epithet meaning holy or divine, given to gods, goddeſſes, and men; among them to Viſhnu; but it is not diſcriminative. *Keſava* is a name of Kriſhna and Viſhnu, ſaid to allude to the fineneſs of the hair of the incarnated deity. *Madhava* is derived from a giant named Madhu, deſtroyed by Viſhnu: it is a name alſo of Kriſhna, as is *Murari* of both. *Trivikera*, or *Trivikrama*, alluding to *three ſteps*, taken by Viſhnu in the Vamanavatara, is a deſignation by which he is not unfrequently called. *Pitamba*, or *Pitamber*, deſcriptive of a yellow coloured garment worn by Kriſhna, is ſometimes given as a name to him and to Viſhnu. See PRITHU, for ſome account of that name and form of the deity now under our conſideration, and WITTOBA for another. *Shyamula*, meaning *black-faced*, is a name applied to Parvati as well as to Viſhnu, in his form of Kriſhna, who is uſually black or blue-faced. *Syama* has the like derivation. Vinkatyeiſh, Vinkatramna, Viratarupa, and Yadava, are other names of Viſhnu. *Yama*, the judge of departed ſouls, is ſometimes called an emanation of him. The name Viſhnu is ſaid to come from the root *vis*, which means to *penetrate* or *pervade;* and may allude to him more particularly in his form of Surya, or the ſun. (See SURYA.) All theſe names of Viſhnu, and a great many others, are diſcuſſed, as to their derivation and myſtical properties, in a Sanſcrit poem called "Sahaſra Nama."

The name of this important mythological perſonage is variouſly pronounced in different parts of India, and variouſly written by Europeans: Biſhen, Viſnu, Viſhnoo, &c.

Theſe may ſuffice of the names of Viſhnu. Like other Hindoo gods, he has a particular abode aſſigned him: his is called *Vaikontha;* which ſee.

VISHWARUPA, is the father of the two wives of Ganeſa, the god of prudence and policy; called alſo *Pollear*, which ſee. The names of theſe wives were Sidi and Budhi. (See SIDI.) Viſhwarupa, or Viſwarupa, is ſaid to be the ſon of *Twaſhta*, or *Viſwakarma*. See thoſe articles.

VISIAPOUR, in *Geography*. See BEJAPOUR.

VISIAPOUR, *Viſapour*, or *Bejapour*, a country, and at a former period a conſiderable kingdom, of Hindooſtan, bounded on the N. by Dowlatabad, on the E. by Golconda, on the S. by Myſore, and on the W. by the Gauts, or mountains which ſeparate it from Concan: formerly governed by kings of the Patan race; afterwards conquered by Aurungzebe, and now in poſſeſſion of the Mahrattas.

VISIBLE, VISIBILE, ſomething that is an object of ſight, or viſion; or ſomething by which the eye is affected, ſo as to produce a ſenſation. See SIGHT and VISION.

The ſchool philoſophers make two kinds of viſibles, or viſible objects; the one *proper*, or *adequate*, which are ſuch as are no other way perceivable but by ſight alone; the other *common*, which are ſubject to divers ſenſes, as the ſight, hearing, feeling, &c.

Again, the firſt, or *proper object of viſion*, is of two kinds, *viz. light* and *colour;* for theſe two are only ſenſible by ſight. The firſt, and primary, *viz. light*, they make the formal, and *colour*, the material object.

The Carteſians think they philoſophize better, when they ſay that light alone is the proper object of viſion; whether it flow from a luminous body through a tranſparent medium, and retains its firſt name, *light*, or whether it be reflected from opaque bodies, under a certain new modification, or habitude, and exhibit their images; or, laſtly, whether in being reflected, it is likewiſe refracted, after this or that manner, and affects the eye with the appearance of *colour*.

But, agreeable to ſir Iſaac Newton's ſentiments, colour alone is the proper object of ſight; colour being that property of light by which the light itſelf is viſible, and by which the images of opaque bodies are painted on the retina.

Ariſtotle (De Anima, lib. ii.) enumerates five kinds of common viſibles, which are uſually received for ſuch in the ſchools, *viz. motion*, *reſt*, *number*, *figure*, and *magnitude*.

Others maintain nine, as in the verſes:

"Sunt objecta novem viſus communia: quantum,
Inde figura, locus, ſequitur diſtantia, ſitus,
Continuumque et diſcretum, motuſque, quieſque."

Authors reaſon very variouſly as to theſe common objects of viſion; there are two principal opinions among the ſchoolmen.

The adherents to the firſt hold, that the common viſibles produce proper repreſentations of themſelves, by ſome peculiar ſpecies, or image, by which they are formally perceived, independently of the proper viſibles.

But the ſecond opinion prevails moſt, which imports, that the common viſibles have not any ſuch formal peculiar ſpecies to become viſible by; but that the proper objects are ſufficient to throw themſelves in this or that place or ſituation, and in this or that diſtance, figure, magnitude, &c. by the circumſtances of their conveyance to the ſenſory.

In effect, ſince theſe common viſibles cannot be repreſented alone (for whoever ſaw place, diſtance, figure, ſituation, &c. of itſelf?), but are always conveyed along with the images of light and colour to the organ; what neceſſity is there to conceive any ſuch proper images by which the common viſibles ſhould be formally perceived by the ſoul? It is much more probable, that from the peculiar manner in which the ſenſitive faculty perceives a proper object, it is apprized of its being in this or that ſituation or place; in this or that figure, magnitude, &c. How this is effected may be conceived from what follows:

I. The ſituation and place of viſible objects are perceived without any intentional ſpecies of them, merely by the impulſe being made from a certain place and ſituation, either above or below, on the right or left, before or behind, by which the rays of the proper viſibles are thrown upon the retina, and their impreſſion is conveyed to the ſenſory.

For, ſince an object is ſeen by thoſe rays which carry its image to the retina, and in that place to which the viſible power is directed by the rays it receives, as it perceives the impulſe of the rays to come from any place, &c. it is abundantly admoniſhed of the objects being in that place and ſituation. See *Apparent* PLACE.

Philoſophers, in general, had formerly taken for granted, that the place to which the eye refers any viſible object, ſeen by reflection or refraction, is that in which the viſual ray meets a perpendicular from the object upon the reflecting or the

the refracting plane. That this is the case with respect to plane mirrors is universally acknowledged; and some experiments with mirrors of other forms seem to favour the same conclusion, and thereby afford reason for extending the analogy to all cases of vision. If a right line be held perpendicularly over a convex or concave mirror, its image seems to make one line with it. The same is the case with a right line held perpendicularly within water; for the part which is within the water seems to be a continuation of that which is without, at least when it is viewed with no more than common attention, and in some positions. But Dr. Barrow called in question this method of judging of the place of an object, and thereby opened a new field of enquiry and debate in this branch of science. This, with other optical investigations, he published in his Optical Lectures, first printed in 1674. Having, as he imagined, refuted the common hypothesis concerning the place of visible objects, he substitutes another rule, by which, he says, our judgments are actually directed in this case. According to him, we refer every point of an object to the place from which the pencils of light, that give us the image of it, issue, or from which they would have issued, if no reflecting or refracting substance intervened. Pursuing this principle, Dr. Barrow proceeded to investigate the place, in which the rays, issuing from each of the points of an object, and which reach the eye after one reflection or refraction, meet; and he found, that if the refracting surface was plane, and the refraction was made from a denser medium into a rarer, those rays would always meet in a place between the eye and a perpendicular to the point of incidence.

If a convex mirror be used, the case will be the same; but if the mirror be plane, the rays will meet in the perpendicular, and beyond it if it be concave. He also determined, according to these principles, what form the image of a right line will take when it is presented in different manners to a spherical mirror, or when it is seen through a refracting medium.

Dr. Barrow, however, mentions an objection against the maxim which he endeavoured to establish, concerning the supposed place of visible objects, and candidly owns that he was not able to give a satisfactory solution of it. The objection is this; let an object be placed beyond the focus of a convex lens, and if the eye be close to the lens, it will appear confused, but very near to its true place. If the eye be a little withdrawn, the confusion will increase, and the object will seem to come nearer; and when the eye is very near the focus, the confusion will be exceedingly great, and the object will seem to be close to the eye. But in this experiment the eye receives no rays but those that are converging; and the point from which they issue is so far from being nearer than the object, that it is beyond it; notwithstanding which, the object is conceived to be much nearer than it is, though no very distinct idea can be formed of its precise distance.

The first person who took much notice of Dr. Barrow's hypothesis, and the difficulty attending it, was Dr. Berkeley, who, in his Essay on a New Theory of Vision, p. 30, observes, that the circle formed upon the retina by the rays which do not come to a focus, produces the same confusion in the eye, whether they cross one another before they reach the retina, or tend to it afterwards: and therefore, that the judgment concerning distances will be the same in both the cases, without any regard to the place from which the rays originally issued; so that in this case, as, by receding from the lens, the confusion, which always accompanies the nearness of an object, increases, the mind will judge that the object comes nearer. See *Apparent* DISTANCE.

M. Bouguer, an ingenious writer on Optics, in his Traite d'Optique, p. 104, adopts the general maxim of Dr. Barrow, in supposing that we refer objects to the place from which the pencils of rays seemingly converge at their entrance into the pupil. But when rays issue from below the surface of a vessel of water, or any other refracting medium, he finds that there are always two different places of this seeming convergence: one of them of the rays that issue from it in the same vertical circle, and, therefore, fall with different degrees of obliquity upon the surface of the refracting medium, and another of those that fall upon the surface with the same degree of obliquity, entering the eye laterally with respect to one another. Sometimes, he says, one of these images is attended to by the mind, and sometimes the other; and different images may be observed by different persons. An object, plunged into water, affords an example, he says, of this duplicity of images.

G. W. Krafft has ably supported the opinion of Dr. Barrow, that the place of any point seen by reflection from the surface of any medium, is that in which rays issuing from it, infinitely near to one another, would meet; and considering the case of a distant object, viewed in a concave mirror by an eye very near to it, when the image, according to Euclid and other writers, would be between the eye and the object, and the rule of Dr. Barrow cannot be applied; he says, that in this case, the speculum may be considered as a plane, the effect being the same, only that the image is more obscure. Com. Petropol. vol. xii. p. 252. 256. See Priestley's Hist. of Light, &c. p. 89. 688, &c.

From the principle above illustrated, several remarkable phenomena of vision are accounted for: as,

1. That if the distance between two visible objects be an angle that is insensible, the distant bodies will appear as if contiguous: whence a continuous body being the result of several contiguous ones; if the distances between several visibles subtend insensible angles, they will appear one continuous body; which gives a pretty illustration of the notion of a continuum.

Hence parallel lines, and long vistas, consisting of parallel rows of trees, seem to converge more and more, the farther they are extended from the eye; because the apparent magnitudes of their perpendicular intervals are perpetually diminishing, while, at the same time, we mistake their distance. When two parallel rows of trees stand upon an ascent, the more remote parts appear farther off than they really are, because the line that measures the length of the vistas now appears under a greater angle than when it was horizontal; the trees, in such a case, seeming to converge less, and sometimes, instead of converging, seeming to diverge. See PARALLELISM *of Rows of Trees*.

The proper method of drawing the appearance of two rows of trees that shall appear parallel to the eye, is a problem that has exercised the ingenuity of several philosophers and mathematicians. That the apparent magnitude of objects decreases with the angle under which they are seen, has always been acknowledged: and it is also acknowledged, that we learn to form a judgment both of magnitudes and distances only by custom and experience; but in the application of these maxims to the above mentioned problem, all persons, before M. Bouguer, made use of the real distance instead of the apparent one, by which only the mind can form its judgment. And it is manifest, that if any circumstances contribute to make the distance appear otherwise than it is in reality, the apparent magnitude of the object will be affected by it, for the same reason, that if the magnitude be misapprehended, the idea of the distance will vary. For want of attending to this distinction,

tinction, Tacquet pretended to demonstrate, that nothing can give the idea of two parallel lines to an eye situated at one of their extremities, but two hyperbolical curves, turned the contrary way; and M. Varignon maintained, that, in order to make a vista appear of the same width, it must be made narrower, instead of wider, as it recedes from the eye. M. Bouguer observes, that very great distances, and those that are considerably less, make nearly the same impression upon the eye. We, therefore, imagine great distances to be less than they are, and on this account the ground plan of a vista always appears to rise. The visual rays come in a determinate direction, but as we imagine they terminate sooner than they do, we necessarily conceive that the place from which they issued is elevated.

Every large plane, therefore, as A B (*Plate* XX. *Optics*, *fig.* 5.) viewed by an eye at O, will seem to lie in such direction as A *b*; and consequently lines, in order to appear truly parallel, on the plane A B, must be drawn so as that they would appear parallel on the plane A *b*, and be from thence projected to the plane A B. To determine the inclination of the apparent ground plane A *b* to the true ground plane A B, M. Bouguer directs us to draw upon a piece of level ground two straight lines of a sufficient length, making an angle of three or four degrees with one another. Then a person placing himself within the angle, with his back towards the angular point, must walk backwards and forwards till he can fancy the lines to be parallel. In this situation, a line, drawn from the point of the angle through the place of his eye, will contain the same angle with the true ground plane which this does with the apparent one.

M. Bouguer also shews other more geometrical methods of determining this inclination, and says, that by these means, he has often found it to be four or five degrees, though sometimes only two, or two and a half degrees; the determination of this angle being variable, and depending upon the manner in which the ground is illuminated, and the intensity of the light, the colour of the soil, the conformation of the eye, and the part of the eye on which the object is painted.

In looking towards a rising ground, the difference between the apparent ground plane and the true one, he says, will be much more considerable, so that they will sometimes make an angle of 25 or 30 degrees. Ac. Par. 1755. M. 156.

2. If the eye be placed above an horizontal plane, objects, the more remote they are, the higher will they appear, till the last be seen in a level with the eye. Whence it is that the sea, to persons standing ashore, seems to rise higher and higher the farther they look.

3. If any number of objects be placed below the eye, the most remote will appear the highest; if they be above the eye, the most remote will appear the lowest.

Thus the remoter parts of a horizontal walk, or long floor, will appear to ascend gradually; whereas, the cieling of a long gallery appears to descend.

M. Bouguer observes, that when a man stands upon a level plane, it does not seem to rise sensibly, but at some distance from him: the apparent plane, therefore, has a curvature in it, the form of which is not very easy to determine; so that a man standing upon a level plane of infinite extent, will imagine that he stands in the centre of a bason. The case is the same with a person standing upon the level of the sea.

4. The upper parts of high objects appear to stoop, or incline forwards; as the front of churches, towers, &c. And statues at the tops of buildings, to appear upright, must incline, or bend backwards. See farther under the articles of REFRACTION and HORIZON.

II. The mind perceives the distance of visible objects, from the different configurations of the eye, and the manner in which the rays strike the eye, and in which the image is impressed on it. For the eye disposes itself differently, according to the different distances it is to see; viz. for remote objects the pupil is dilated, and the crystalline brought nearer the retina, and the whole eye is made more globular; on the contrary, for near objects, the pupil is contracted, the crystalline thrust forwards, and the eye lengthened.

Philosophers are agreed, that we have a power of altering the form of our eyes, so as to make the rays of any pencil to converge at different distances from the pupil: and hence we are capable of viewing objects with almost equal distinctness, though they are placed at considerably different distances; but with regard to the alteration that takes place in the eye, and the mechanism by which it is produced, different accounts have been given.

It was the opinion of Kepler, that the contraction of the processus ciliares changes the form of the eye, and by the elongation of it, places the crystalline at a greater distance from the retina; whereas Des Cartes imagined, that the curvature of the crystalline itself suffers an alteration by the contraction of those ligaments.

M. de la Hire maintained that, in order to view objects at different distances, there is no alteration but in the size of the pupil, or the aperture of the eye; and he made a curious experiment, which, he thought, proved his assertion.

M. Le Roi, a member of the Royal Academy at Montpelier, has lately attempted to defend the opinion of M. de la Hire, which had long been exploded by all philosophers; and he says, that the accommodation of the eye to the view of objects, placed at different distances, by the contraction or dilatation of the pupil only, does not consist in the change of the place of the crystalline, by means of the ligamenta ciliaria, the strength of which is inadequate to the purpose. Besides, he observes, that they are not attached to the edge of the capsula, as has been supposed, but that they extend a considerable way along the interior surface of it, without any close adherence to it. He is also of opinion that these fibres are not muscular, but are only ramified vessels, which, according to all appearance, he says, answer no other purpose than that of secreting an aqueous humour, to lubricate the surface of the crystalline.

That nothing is requisite but the contraction of the pupil in order to view the nearest objects with distinctness, is evident, he says, from experiment. For when an object is placed so near, that the eye cannot bear as great a degree of contraction as is necessary for viewing it distinctly, the same end is obtained by an artificial pupil. For if a small hole be made in a card, the nearest object may be viewed through it with the greatest ease and distinctness.

That the variation of the pupil is sufficient for the purpose of viewing objects at all distances, he also thought he could demonstrate by experiment with an artificial eye; for when, with a large aperture, the images of near objects were confused, and ill defined upon the retina of this instrument, they became very distinct, and well defined, by contracting the aperture. Ac. Paris, 1755. M. p. 920.

But the most satisfactory discussion of this subject we owe to Dr. Porterfield, who proved, by a series of experiments,

ments, in which an object was viewed through small slits in a thin plate of iron, at a less distance than the diameter of the pupil (which, therefore, was of no use in this case), that we are possessed of a power of changing the conformation of our eyes, and of adapting them to various distances; and that this change always follows a similar motion in the axes of vision, with which it has been connected by use and custom. Porterfield on the Eye, vol. i. p. 411. 415. 421.

However, among those who suppose a conformation of the eye for this purpose, independent of a variation in the aperture, it is by no means agreed in what it consists. Some have said, that the crystalline becomes more or less convex for this purpose, by the action of certain muscular fibres which enter into its composition. But Dr. Porterfield (ubi supra, p. 442.) observes that, though the crystalline, when dry, appears to consist of many thin concentric laminæ, or scales, their disposition is but ill qualified for changing the figure of the crystalline; or if they were so, it is not easy, he says, to prove that these fibres are muscular, and capable of contraction.

His own opinion is, that the crystalline has a motion by means of the ligamentum ciliare, by which the distance between it and the retina is increased or diminished, according to the different distances of objects. The structure and disposition of the ligamentum ciliare, he says, excellently qualify it for changing the situation of the crystalline, and removing it to a greater distance from the retina, when objects are too near for us; because, when it contracts, it will not only draw the crystalline forward, but also compress the vitreous humour lying behind it, so that it must press upon the crystalline, and push it towards the retina.

He adds, that the crystalline, being moved forwards, must, at the same time, press the aqueous humour against the cornea; by which means that membrane, which is flexible, will be rendered more convex, and enable us still better to see near objects distinctly.

That the situation of the crystalline is made use of in conforming the eye to the distinct view of objects placed at different distances, Dr. Porterfield thinks, is very evident from what is observed concerning persons who have cataracts couched; for the same lens is not useful to them for seeing all objects distinctly, but they are obliged to make use of glasses of different degrees of convexity, in proportion to the nearness of the object.

To the objection of M. de la Hire, and others, among whom are the celebrated anatomists Haller and Zinn, that the ciliary ligament is not muscular, and consequently has no power of contraction, he observes, that they have been led into this mistake by apprehending that the colour of muscles is always red; whereas this is not the case universally, for the muscular fibres of the intestines and stomach have hardly any redness in their colour. It is also certain, he says, that the pupil contracts and dilates itself according as objects are more or less luminous, and yet none of the fibres which perform that action are in the least red. Ubi supra, vol. ii. p. 434. 447. 450.

Dr. Jurin (Ess. on distinct, &c. Vision, p. 143.) supposes, that when the eye is to be suited to greater distances than fifteen or sixteen inches, the ligamentum ciliare contracts, so as to draw part of the anterior surface of the capsula of the crystalline, into which the fibres of it are inserted, a little forwards and outwards, on which the water within the capsula must flow from under the middle towards the elevated part of it; and the aqueous humour must flow from above the elevated part of the capsula to the middle. In consequence of this, the whole anterior surface, within the insertion of the ciliary ligament, will be reduced to a less convexity. When this contraction ceases, the capsula will return to its former situation, by its own elasticity. To this hypothesis it has been objected, that unless the water within the capsula has a greater refractive power than the aqueous humour, the retiring of it from one place to another to make room for that humour, will have no effect upon the pencils of rays.

Dr. Jurin, however, not attending to this circumstance, and seeming to consider the water within the capsula as having the same refractive power with the crystalline itself, attempts to shew by calculation, that this change in the convexity of it is quite sufficient to extend the natural distance of distinct vision from fifteen inches to fourteen feet five inches, without the least motion of the crystalline itself, and a very small one of the anterior surface of the capsula.

M. Muschenbroeck, or rather Albinus (whose Anatomical Observations on the Eye he has published in his Introd. ad Phil. Nat. vol. ii. p. 759.), supposes, that the change of conformation in the eye is performed by means of the zona ciliaris, in the following manner. In viewing a very near object, in consequence of which the pencils of rays tend to a focus beyond the retina, the zona ciliaris, and the anterior membrane of the capsula, as also the vitreous humour, being driven forward by the compression of the coats of the eye, push the crystalline, and make it recede from the retina. At the same time the crystalline, pushing the aqueous humour into the cornea, makes it more prominent. Perhaps, also, he says, the crystalline may be made rounder, so that, on these accounts, the pencils will come to their foci sooner than otherwise. On the other hand, when the object is too remote for distinct vision, so that the pencils come to their foci too soon, the zona ciliaris becomes tense, and, with the anterior membrane of the capsula, pushes the crystalline farther within the vitreous humour. By this pressure the crystalline becomes flatter, so that, on these several accounts, the foci of the pencils are carried farther. The zona ciliaris, and the anterior membrane of the capsula, can only push the crystalline into the vitreous humour one half of its own thickness, which he shews is not sufficient to make vision distinct at a competent distance, and therefore concludes, that some change must take place in the form of the crystalline, as, he says, Dr. Pemberton has well demonstrated. He supposes, that the provision for suiting the eye to different distances is the same in all animals, and does not depend on the change of the sclerotica in any of them, which is hard, and incapable of being compressed. Priestley's Hist. of Light, &c. p. 638—652. See *Apparent* DISTANCE. See also EYE.

It seems to be now pretty generally allowed, that the change, by which the eye accommodates itself to different distances, is produced by an increase of the convexity of the crystalline lens, arising from an internal cause. The arguments in favour of this conclusion are of two kinds; some of them are negative, derived from the impossibility of imagining any other mode of performing the accommodation, without exceeding the limits of the actual dimensions of the eye, and from the examination of the eye in its different states by several tests, capable of detecting any other changes if they had existed: for example, by the application of water to the cornea, which completely removes the effect of its convexity, without impairing the power of altering the focus, and by holding the whole eye, when turned inwards, in such a manner as to render any material alteration of its length utterly impossible. Other arguments

guments are deduced from positive evidence of the change of form of the crystalline, furnished by the particular effects of refraction and aberration which are observable in the different states of the eye; effects which furnish a direct proof that the figure of the lens must vary; its surfaces, which are nearly spherical in the quiescent form of the lens, assuming a different determinable curvature when it is called into exertion. The objections which have been made to this conclusion are founded only on the appearance of a slight alteration of focal length in an eye from which the crystalline had been extracted; but the fact is neither sufficiently ascertained, nor was the apparent change at all considerable: and even if it were proved that an eye without the lens is capable of a certain small alteration, it would by no means follow that it could undergo a change five times or ten times as great.

The motion of the optical axes serves likewise, as we have already observed, to assist us in judging of the distance of objects. These axes, or the directions of the rays falling on the points of most perfect vision, naturally meet at a great distance; that is, they are nearly parallel to each other; and in looking at a nearer object, we make them converge towards it, wherever it may be situated, by means of the external muscles of the eye; while in perfect eyes the refractive powers are altered, at the same time, by an involuntary sympathy, so as to form a distinct image of an object at a given distance. This correspondence of the situation of the axes with the focal length is in most cases unalterable; but some have perhaps a power of deranging it in a slight degree, and in others the adjustment is imperfect: but the eyes seem to be in most persons inseparably connected together with respect to the changes that their refractive powers undergo, although it sometimes happens that those powers are originally very different in the opposite eyes.

These motions enable us to judge pretty accurately, within certain limits, of the distance of an object; and beyond these limits, the degree of distinctness or confusion of the image still continues to assist the judgment. We estimate distances much less accurately with one eye than with both, since we are deprived of the assistance usually afforded by the relative situation of the optical axes; thus we seldom succeed at once in attempting to pass a finger or a hooked rod sideways through a ring, with one eye shut. Our idea of distance is usually regulated by a knowledge of the real magnitude of an object, while we observe its angular magnitude; and on the other hand, a knowledge of the real or imaginary distance of the object often directs our judgment of its actual magnitude. The quantity of light intercepted by the air interposed, and the intensity of the blue tint which it occasions, are also elements of our involuntary calculation: hence, in a mist, the obscurity increases the apparent distance, and consequently the supposed magnitude of an unknown object. We naturally observe, in estimating a distance, the number and extent of the intervening objects; so that a distant church in a woody and hilly country appears more remote than if it were situated in a plain; and for a similar reason, the apparent distance of an object seen at sea, is smaller than its true distance. Young's Course of Lectures on Natural Philosophy, &c. vol. i.

Accordingly, in judging of the distance of a visible object, we must take into our account the angle which the object makes, with the distinct or confused representation of the object; and the briskness or feebleness, or the rarity or spissitude of the rays.

To this it is owing, 1. That objects which appear obscure, or confused, are judged to be more remote; a principle which the painters use to make some of their figures appear farther distant than others on the same plane. Thus, supposing the eye to be accommodated to a given distance, objects at all other distances may be represented with a certain indistinctness of outline, which would accompany the images of the objects themselves on the retina; and this indistinctness is so generally necessary, that its absence has the disagreeable effect called hardness. The apparent magnitude of the subjects of our design, and the relative situations of the intervening objects, may be so imitated by the rules of geometrical perspective as to agree perfectly with nature, and we may still further improve the representation of distance by attending to the art of aerial perspective, which consists in a due observation of the loss of light, and the blueish tinge, occasioned by the interposition of a greater or less depth of air between us and the different parts of the scenery.

We cannot indeed so arrange the picture, that either the focal length of the eye, or the position of the optical axes, may be such as would be required by the actual objects: but we may place the picture at such a distance, that neither of these criterions can have much power in detecting the fallacy; or, by the interposition of a large lens, we may produce nearly the same effects in the rays of light, as if they proceeded from a picture at any required distance. In the panorama, which has lately been exhibited in many parts of Europe, the effects of natural scenery are very closely imitated: the deception is favoured by the absence of all other visible objects, and by the faintness of the light, which assists in concealing the defects of the representation, and for which the eye is usually prepared, by being long detained in the dark winding passages which lead to the place of exhibition. Young, *ubi supra*. See *Apparent* MAGNITUDE.

2. To this it is likewise owing, that rooms, whose walls are whitened, appear the smaller; that fields covered with snow, or white flowers, shew less than when clothed with grass; that mountains covered with snow, in the night-time, appear the nearer; and that opaque bodies appear the more remote in the twilight.

III. The magnitude or quantity of visible objects is known chiefly by the angle comprehended between two rays drawn from the two extremes of the object to the centre of the eye. An object appears to be as large as the angle it subtends; or bodies seen under a greater angle appear greater; and those under a less, less, &c. Hence the same thing appears now bigger, and now less, as it is less or more distant from the eye. This we call the *Apparent* MAGNITUDE; which see.

Now, to judge of the real magnitude of an object, we consider the distance; for, since a near and remote object may appear under equal angles, the distance must necessarily be estimated; that if it be great, and the optic angle small, the remote object may be judged great; and *vice versa*.

The magnitude of visible objects is brought under certain laws, demonstrated by the mathematicians; as,

1. That the apparent magnitudes of a remote object are as the distances reciprocally; or rather, in a somewhat less ratio.

2. That the co-tangents of half the apparent magnitudes of the same objects, are as the distances; hence the apparent magnitude and distance being given, we have a method of determining the true magnitude; the canon is this. As the whole sine is to the tangent of half the apparent magnitude, so is the given distance to half the real magnitude. The same canon, inverted, will, from the distance and magnitude given, determine the apparent one.

3. Objects seen under the same angle, have their magnitudes proportional to their distances.

4. The

4. The subtense A B (*Plate* XX. *Optics*, *fig.* 6.) of any arc of a circle appears of equal magnitude in all the points D C E G, though one point be vastly nearer than another; and the diameter D G appears of the same magnitude in all the points of the periphery of the circle. Hence some have derived a hint for the most commodious form of theatres.

5. If the eye be fixed in A (*fig.* 7.), and the right line B C be moved in such manner, as that the extremes of it always fall on the periphery, it will always appear of the same magnitude. Hence the eye, being placed in any angle of a regular polygon, the sides will appear equal.

6. If the magnitude of an object directly opposite to the eye be equal to its distance from the eye, the whole object will be taken in by the eye, but nothing more. Whence the nearer you approach an object, the less part you see of it.

IV. The figure of visible objects is estimated, chiefly, from our opinion of the situation of the several parts of it.

This opinion of the situation, &c. enables the mind to apprehend an external object under this or that figure, more justly than any similitude of the images in the retina, with the object, can; the images being frequently elliptical, oblong, &c. when the objects they exhibit to the mind are circles, squares, &c.

The laws of vision, with regard to the figures of visible objects, are:

1. That if the centre of the pupil be exactly against, or in the direction of a right line, the line will appear as one point.

2. If the eye be placed in a direction of a surface, so that only one line of the perimeter can radiate on it, it will appear as a line.

3. If a body be opposed directly towards the eye, so as only one plane of the surface can radiate on it, it will appear as a surface.

4. A remote arc, viewed by an eye in the same plane, will appear as a right line.

5. A sphere, viewed at a distance, appears a circle.

6. Angular figures, at a distance, appear round.

7. If the eye look obliquely on the centre of a regular figure, or a circle, the true figure will not be seen; but the circle will appear oval, &c. See *Apparent* FIGURE.

V. The number of visible objects is perceived, not only by one or more images formed in the fund of the eye; but also by such a position of those parts of the brain whence the optic nerves spring, as the mind has been used to, in attending to a certain place; and that either single or manifold.

Accordingly, when either of the eyes, with the contiguous part of the brain, are forced out of their just parallelism, with the other, *v. gr.* by pressing it with the finger, &c. all things appear double; but when they are in the requisite parallelism, though there be two images in the fund of the two eyes, yet the object will appear single. Again, one thing may appear double, or even manifold, not only with both eyes, but even with only one of them open; by reason the common concourse of the cones of rays reflected from the object to the eye, either falls short of the retina, or goes much beyond it.

VI. Motion and rest are seen when the images of objects represented in the eye, and propagated to the brain, are either moved, or at rest; and the mind perceives these images either moving or at rest, by comparing the moved image to another, with respect to which it changes place; or by the situation of the eye to the object being continually changed. So that motion is only perceived, by perceiving the images to be in different places and situations; nor are these changes perceived unless effected in time. So that to perceive motion, a sensible time is required. But rest is perceived by the visual faculty, from the reception of the image in the same place of the retina, and the same situation for some sensible time.

Hence the reason, why bodies moving exceedingly fast appear at rest; thus, a live coal, swung briskly round, appears a continual circle of fire; the motion not being commensurate with visible time, but much swifter than the same; so that, in the time the soul requires to judge of any change of situation of the image on the retina, or that it is moved from this place to that, the thing itself performs its whole circuit, and is in its own place again.

Laws of vision, with regard to the motion of visibles, are:

1. That if two objects unequally distant from the eye move from it with equal velocity, the more remote one will appear the slower; or, if their celerities are proportionable to their distances, they will appear to move equally swift.

2. If two objects, unequally distant from the eye, move with unequal velocities in the same direction, their apparent velocities are in a ratio compounded of the direct ratio of their true velocities, and the reciprocal one of their distances from the eye.

3. A visible object, moving with any velocity, appears to be at rest, if the space described in the interval of one second be imperceptible at the distance of the eye. Hence it is, that a near object, moving very slowly, as the index of a clock; or a remote one very swiftly, as a planet; seem at rest.

4. An object moving with any degree of velocity, will appear to rest, if the space it runs over in a second of time be to its distance from the eye, as 1 to 1400: nay, in fact, if it be as 1 to 1300.

5. The eye proceeding straight from one place to another, a lateral object, not too far off, either on the right or left, will seem to move the contrary way: the eye, in this case, being sensible of its motion, distant objects will seem to move the same way, and with the same velocity.

6. If the eye and the object move both the same way, only the eye much swifter than the object, that last will appear to go backwards.

7. If two or more objects move with the same velocity, and a third remain at rest, the moveables will appear fixed, and the quiescent in motion the contrary way. Thus, clouds moving very swiftly, their parts seem to preserve their situation, and the moon to move the contrary way.

8. If the eye be moved with a great velocity, lateral objects at rest appear to move the contrary way. Thus, to a person sitting in a coach, riding briskly through a wood, the trees seem to retire the contrary way; and to people in a ship, &c. the shores seem to recede.

9. An object moving very swiftly is not seen, unless it be very luminous. Thus, a cannon-ball is not seen, if it is viewed transversely; but if it be viewed according to the line it describes, it may be seen, because its picture continues long on the same place of the retina, which, therefore, receives a more sensible impression from the object.

10. A live coal swung briskly round in a circle, appears a continued circle of fire, because the impressions made on the retina of light being of a vibratory, and consequently of a lasting nature, do not presently perish, but continue till the coal performs its whole circuit, and returns again to its former place.

11. If a person turns swiftly round, without changing his place, all objects about him will seem to move round in a circle the contrary way; and this deception continues not only

only while the perſon himſelf moves round, but, which is more ſurpriſing, it alſo continues for ſome time after he ceaſes to move, when the eye, as well as the object, is at abſolute reſt.

The reaſon why objects appear to move round the contrary way, when the eye turns round, is not ſo difficult to explain; for though, properly ſpeaking, motion is not ſeen, as not being itſelf the immediate object of ſight, yet by the ſight we eaſily know when the image changes its place on the retina, and thence conclude that either the object, or the eye, or both, are moved. But by the ſight alone we can never determine how far this motion belongs to the object, how far to the eye, or how far to both.

If we imagine the eye at reſt, we aſcribe the whole motion to the object, though it be truly at reſt. If we imagine the object at reſt, we aſcribe the whole motion to the eye, though it belongs entirely to the object: and when the eye is in motion, though we are ſenſible of its motion, yet if we do not imagine that it moves ſo ſwiftly as it really does, we aſcribe only a part of the motion to the eye, and the reſt of it we aſcribe to the object, though it be truly at reſt.

This laſt, ſays Dr. Porterfield, is what happens in the preſent caſe, when the eye turns round; for though we are ſenſible of the motion of the eye, yet we do not apprehend that it moves ſo faſt as it really does; and, therefore, the bodies about appear to move the contrary way, as is agreeable to experience.

But the great difficulty ſtill remains, *viz.* why, after the eye ceaſes to move, objects ſhould, for ſome time, ſtill appear to continue in motion, though their pictures on the retina be truly at reſt, and do not at all change their place.

This, Dr. Porterfield imagined, proceeds from a miſtake with reſpect to the eye, which, though it be abſolutely at reſt, we nevertheleſs conceive it as moving the contrary way to that in which it moved before; from which miſtake, with reſpect to the motion of the eye, the objects at reſt will appear to move the ſame way which the eye is imagined to move; and conſequently will ſeem to continue their motion for ſome time after the eye is at reſt. Porterfield on the Eye, vol. ii. p. 422. 424.

VISIBLE *Horizon*, *Place*, and *Species*. See the ſubſtantives.

VISIER, VIZIER, or *Viſir*, an officer or dignitary in the Ottoman empire, of which there are two kinds; the firſt called by the Turks *viſir azem*, that is, *grand viſir*, firſt created in 1370, by Amurath I., in order to eaſe himſelf of the chief and weighter affairs of the government.

The *grand*, or *prime viſir*, is the prime miniſter of ſtate of the whole empire, and preſides at the divan, or great council. Being the lieutenant of the ſultan, in whoſe name he governs, and from whom he holds the ſeal, inveſted with the greateſt authority, and entruſted with all the power of execution, the viſir may ſtrike off the heads of perſons receiving ſalaries who oppoſe the progreſs of the government, who throw obſtacles in the way of its adminiſtration, who do not obey its orders, or do not execute them according to its pleaſure; he commands the armies in perſon; he diſpoſes of the finances; he names, or cauſes perſons to be named, to all the adminiſtrative and military employments. Nothing, in a word, is foreign to his powers, but the interpretation of the law entruſted to the ulemas.

But the greater the power of the grand viſir, the greater is his reſponſibility. He is accountable, both to the ſovereign and to the people, for the acts of injuſtice which he commits, for the unfortunate reſult of his adminiſtration, for the extortions which he does not repreſs; he is accountable, above all, for the unexpected dearneſs of proviſions, for too frequent fires, and for the defeats of the armies: all the misfortunes of the ſtate are attributed to him. The ſword, always ſuſpended over his head, ſtrikes him equally whether he diſpleaſe the people, or diſoblige the ſultan.

In the frequent excurſions which he makes incog. in the city, for the purpoſe of having an eye to good order, of informing himſelf of the ſtate of the articles of food, examining the weights and meaſures, and inſpecting the conduct of agents appointed for the diſtribution of proviſions, the viſir, accompanied by a public executioner, and ſome officers diſguiſed like himſelf, orders delinquents to be apprehended and puniſhed on the ſpot: he calls out, if neceſſary, the guard of the quarter; he directs the baſtinado to be given to the ſhop-keepers who vend aliments of bad quality; he cauſes him who is found with falſe weights to be nailed by the ear againſt the door of the ſhop; he even puniſhes with death relapſes or malverſations of too ſerious a nature. During fires, he orders to be ſtruck off the head of the thief caught in the very fact; but, in thoſe caſes, the law has pronounced before-hand the penalty of death. Charged to liſten to the complaints of individuals, to cauſe juſtice to be done to all, the viſir cannot, under any pretext, diſpoſe legally of the life and fortune of citizens. It is not that he does not too frequently abuſe his authority; it is not that he does not ſometimes yield to perfidious advice, that he does not ſuffer himſelf to be led away by motives of hatred and revenge, that the thirſt of gold does not impel him to arbitrary acts; but woe be to him if his injuſtice be too revolting! When he too frequently puts himſelf above the laws, the people, in their turn, trample him under foot, unleſs the ſultan be expeditious in adminiſtering juſtice. Thus circumſtanced, it is extremely rare for a viſir to grow old in the poſt which he occupies.

The title of viſir is given to all the pachas with three tails. Six of theſe ordinary viſirs, whoſe reputation for wiſdom and intelligence was univerſally allowed, formerly compoſed the divan or council of the grand viſir. The viſir aſked their opinion when he thought it neceſſary. Soon after the acceſſion of Selim to the throne, he compoſed this council of twelve perſons the moſt diſtinguiſhed by their office. The viſir and the mufti are preſidents of it; the one in his quality of lieutenant-general of the empire for temporal affairs; the other as vicar of the ſultan for the interpretation and depoſitory of the laws. The other ten members are the kiaya-bey, the reis-effendi, the teſterdar-effendi, the tchélébi-effendi, the terſana-émini, the tchiaoux-bachi, two ex-reis-effendi, and two ex-teſterdars-effendi. See BASHAW, BEY, KIAYA-BEY, &c.

The firſt of thoſe above enumerated is the lieutenant of the viſir; the ſecond is ſecretary of ſtate, or high chancellor of the empire; the third is the miniſter of the finances; the fourth is the receiver-general of the tax on wine, eatables, and moſt articles of merchandize, and the adminiſtrator of theſe funds, &c.; the fifth is the miniſter of marine; the ſixth ſecretary of ſtate.

Renegado Chriſtians have been ſometimes raiſed to the viſirate; ſuch were Khairedain, ſurnamed Barbaroſſa; Ulug Ali, Cuproli, &c.

VISIGAPATAM, in *Geography*, a town of Hindooſtan, in the circar of Cicacole, on the coaſt. Near the town is a pagoda, dedicated to monkeys, which abound in the neighbourhood: they are fed by the prieſts, and regularly aſſemble at certain hours; 50 miles S.W. of Cicacole. N. lat. 17° 40′. E. long. 83° 30′.

VISIGNANO, a town of Iſtria; 11 miles N. of Rovigno.

VISINA, a town of Iſtria; 42 miles S.E. of Umago.

VISION,

VISION, Visio, the act of feeing, or perceiving external objects by the organ of fight.

Vifion is well defined to be a fenfation, by which, from a certain motion of the optic nerve, made in the bottom of the eye by the rays of light emitted or reflected from objects, and hence conveyed to the common fenfory in the brain, the mind perceives the luminous object, its quantity, quality, figure, &c.

The phenomena of vifion, the caufes of it, and the manner in which it is effected, make one of the greateft and moft important articles in the whole fyftem of natural knowledge. Indeed, a great part of the phyfical, mathematical, and anatomical difcoveries and improvements of the moderns, terminate here, and only tend to fet the bufinefs of vifion in a clearer light.

Hitherto refer what fir Ifaac Newton and others have difcovered of the nature of light and colours; the laws of inflection, reflection, and refraction of the rays, the ftructure of the eye, particularly the retina and optic nerves, &c.

It is not neceffary we fhould here give a minute detail of the procefs of vifion from its firft principles; the greateft part is already delivered under the refpective articles. The eye, the organ of vifion, we have defcribed under the article Eye; and its feveral parts, tunics, humours, &c. under their proper heads, Cornea, Crystalline, &c.

The immediate and principal organ of vifion, *viz.* the retina, according to fome, and the choroides, according to others, are alfo diftinctly confidered; as alfo the ftructure of the optic nerve, which conveys the impreffion to the brain; and the texture and difpofition of the brain itfelf, which receives them, and reprefents them to the foul. See Retina, Choroides, Optic *Nerves*, Brain, Sensory, &c.

By means of this arrangement of the various refracting fubftances, many peculiar advantages are procured. The furface of the cornea only, if it had been more convex, could not have collected the lateral rays of a direct pencil to a perfect focus, without a different curvature near its edges; and then the oblique pencils would have been fubjected to greater aberration, nor could they have been made to converge to any focus on the retina. A fecond refraction performs both thefe offices much more completely, and has alfo the advantage of admitting a greater quantity of light. If alfo the furfaces of the cryftalline lens, thus interpofed, had been abrupt, there would have been a reflection at each, and an apparent hazinefs would have interfered with the diftinct view of every luminous object; but this inconvenience is avoided by the gradual increafe of denfity in approaching the centre, which alfo makes the cryftalline equivalent to a much more refractive fubftance of equal magnitude; while, at the fame time, the fmaller denfity of the lateral parts prevents the ufual aberration of fpherical furfaces, occafioned by the too great refraction of the lateral rays of direct pencils, and caufes alfo the focus of each oblique pencil to fall either accurately, or very nearly, on the concave furface of the retina, throughout its extent.

Again, the nature of light, which is the medium or vehicle by which objects are carried to the eye, is laid down at large under the articles Light and Colours; and the chief properties thereof concerned in vifion, under Reflection, Refraction, &c.; and alfo many of its circumftances under Ray, Medium, &c. What remains for this article, therefore, is only to give a general idea of the whole procefs, in which all the feveral parts are concerned.

Vision, *different Opinions or Syftems of.* The Platonifts and Stoics held vifion to be effected by the emiffion of rays out of the eyes; conceiving that there was a fort of light thus darted out; which, with the light of the external air, taking, as it were, hold of the objects, rendered them vifible; and thus returning back again to the eye, altered and new modified by the contact of the object, made an impreffion on the pupil, which gave the fenfation of the object.

The reafons by which they maintain their opinions are derived, 1. From the brightnefs and luftre of the eye. 2. From our feeing a remote cloud, without feeing one with which we are encompaffed (the rays being fuppofed too brifk and penetrating to be ftopped by the near cloud, but growing languid at a greater diftance, are returned to the eye). 3. From our not feeing an object laid on the pupil. 4. From the eye's being weary with feeing; *i. e.* by emitting great quantities of rays. And laftly, from animals which fee in the night, as cats, lions, moles, owls, and fome men.

Our own countryman, Roger Bacon, diftinguifhed as he was in a variety of refpects, does not hefitate to affent to the opinion that vifual rays proceed from the eye; giving this reafon for it, that every thing in nature is qualified to difcharge its proper functions by its own powers, in the fame manner as the fun, and other celeftial bodies. Opus Majus, p. 289.

The Epicureans held vifion to be performed by the emanation of corporeal fpecies, or images from objects; or a fort of atomical effluvia continually flying off from the intimate parts of objects to the eye.

Their chief reafons are, 1. That the objects muft neceffarily be united to the vifive faculty; and fince it is not united by itfelf, it muft be fo by fome fpecies that reprefents it, and that is continually flowing from bodies. 2. That it frequently happens, that old men fee remote objects better than near ones; the diftance making the fpecies thinner, and more commenfurate to the debility of their organ.

The Peripatetics hold, with Epicurus, that vifion is performed by the reception of fpecies; but they differ from him in the circumftances: for they will have the fpecies (which they call *intentionales*) to be incorporeal.

It is true, Ariftotle's doctrine of vifion, delivered in his chapter "De Afpectu," amounts to no more than this; that objects muft move fome intermediate body, that by this they may move the organ of fight. To which he adds, in another place, that when we perceive bodies, it is their fpecies, not their matter, that we perceive; as a feal makes an impreffion on wax, without the wax's retaining any thing of the feal.

But this vague and obfcure account the Peripatetics have thought fit to improve. Accordingly, what their mafter called *fpecies*, the difciples underftanding of real proper fpecies, affert, that every vifible object expreffes a perfect image of itfelf, in the air contiguous to it; and this image another, fomewhat lefs in the next air; and the third, another, &c. till the laft image arrives at the cryftalline, which they hold for the chief organ of fight, or that which immediately moves the foul. Thefe images they call *intentional* fpecies.

The modern philofophers, as the Cartefians and Newtonians, give a better account of vifion. They all agree, that it is performed by rays of light reflected from the feveral points of objects received in at the pupil, refracted and collected in their paffage, through the coats and humours, to the retina; and thus ftriking, or making an impreffion, on fo many points thereof; which impreffion is conveyed, by the correfpondent capillaments of the optic nerve, to the brain, &c.

Baptifta Porta's experiments with the camera obfcura, about the middle of the 16th century, convinced him, that vifion

vision is performed by the intermission of something into the eye, and not by visual rays, proceeding from the eye, as had been the general opinion before his time; and he was the first who fully satisfied himself and others upon this subject, though several philosophers still adhered to the old opinion.

As for the Peripatetic series or chain of images, it is a mere chimæra; and Aristotle's meaning is better understood without than with them. In effect, setting these aside, the Aristotelian, Cartesian, and Newtonian doctrines of vision are very consistent; for sir Isaac Newton imagines, that vision is performed chiefly by the vibrations of a fine medium, which penetrates all bodies excited in the bottom of the eye by the rays of light, and propagated through the capillaments of the optic nerves, to the sensorium. And Descartes maintains, that the sun pressing the materia subtilis, with which the world is filled every way, the vibrations and pulses of this matter reflected from objects are communicated to the eye, and thence to the sensory; so that the action or vibration of a medium is equally supposed in all.

VISION, *Modern Theory of.* In order to vision, we are certain, it is required, that the rays of light be thrown from the visible objects to the eye. What befalls them in the eye will be conceived from what follows.

Suppose, *e. gr.* Z the eye, and A B C the object (*Plate* XX. *Optics*, *fig.* 8.); now, though every point of an object be a radiant point, that is, though there be rays reflected from every point of the object to every point of the circumambient space, each carrying with it its respective colour, (which we falsely imagine to be those of the object,) yet, as only those rays which pass through the pupil of the eye affect the sense, we shall here consider none else but these.

And again, though there be a great number of rays passing from one radiant point, as B, through the pupil; yet we shall only consider the action of a few of them, as B D, B E, B F.

Now, then, the ray B D, falling perpendicularly on the surface E D F, will pass out of the air into the aqueous humour, without any refraction, and proceed right to H, where, falling perpendicularly on the surface of the crystalline humour, it will go on, without any refraction, to M; where, again falling perpendicularly on the surface of the vitreous humour, it will proceed straight to the point O, in the fund or bottom of the eye.

Again, the ray B E, passing obliquely out of the air upon the surface of the watery humour E D F, will be refracted, and approach towards the perpendicular E P; and thus, proceeding to the point G, in the surface of the crystalline, it will be there refracted still nearer to the perpendicular. So also E G, falling obliquely out of air into an harder body, will be refracted towards the perpendicular G R, and, falling on the point L of the surface of the vitreous humour, it will still be brought nearer to M.

Lastly, G L, falling obliquely out of a denser, upon the surface of a rarer body L M N, will be refracted, and recede from the perpendicular L T; in receding from which, it is evident, it approaches towards the ray B D O, and may be so refracted, as to meet the other in O. In like manner, the ray B F, being refracted in B, will turn to I, and thence to N, and thence to the others in O. But the rays between B E and B F, being somewhat less refracted, will not meet precisely in the same point O.

Thus will the radiant point B affect the fund of the eye, in the same manner as if the pupil had no breadth, or as if the radiant itself had only emitted one single ray, such as were equal in power to all those between B E and B F.

In like manner, the rays proceeding from the point A, will be so refracted in passing through the humours of the eye, as to meet near the point X; and the rays from any intermediate point between A and B, will nearly meet in some other point in the fund of the eye between X and O.

Upon the whole, it may be asserted universally, that every point of an object affects one point in the fund of the eye; and, on the contrary, that every point in the fund of the eye only receives rays from one point of the object. Though this is not to be understood with the utmost rigour.

Now, if the object recede from the eye, in such manner as that the radiant point B does not decline from the line B D; the rays which would proceed from B, not enough divaricated, would be so refracted in passing the three surfaces, as that they would meet before they reached the point O; on the contrary, if the object should be brought nearer the eye, the rays passing from the point to the pupil, being too much divaricated, would be refracted so, as not to meet till beyond the point O: nay, the object may be so near, that the rays proceeding from any point may be so divaricated, as that they shall never meet at all. In all which cases, there would be no point of the object but would move a pretty large portion of the fund of the eye; and thus the action of each point would be confounded with that of the contiguous one.

And this would commonly be the case, but that nature has provided against it; either by contriving the eye so that its bulk may be lengthened, or shortened, as objects may be more or less distant; or, as others will have it, so as that the crystalline may be made more convex, or more flat; or, according to others, so as that the distance between the crystalline and the retina may be lengthened or shortened.

The first expedient has been thought by some to be the most probable; on the footing of which, when we direct our eyes to an object so remote, as that it cannot be distinctly viewed by the eye in its accustomed figure, the eye is drawn back into a flatter figure, by the contraction of four muscles; by which means the retina, becoming nearer the crystalline humour, receives the rays sooner; and, on the other hand, when we view an object too near, the eye, being compressed by the two oblique muscles, is rendered more globular; by which means the retina, being set farther off from the crystalline, does not receive the rays of any point before they meet. See VISIBLE.

Those who maintain the opinion now stated farther allege, that this access and recess of the crystalline is so necessary to vision, that whereas, in some birds, the coats of the eye are of such a bony consistence, that muscles would not have been able to contract and distend them; nature has taken other means, by binding the crystalline down to the retina, with a kind of blackish threads not found in the eyes of other animals. Nor must it be omitted, that of the three refractions above-mentioned, the first is wanting in fishes; and that, to remedy this, their crystalline is not lenticular, as in other animals, but globular. Lastly, since the eyes of old people are generally worn flatter than those of young ones, so that the rays from any point fall on the retina before they become collected into one, they must exhibit the object somewhat confusedly; nor can such eyes see any but remote objects distinctly. In others, whose eyes are too globular, the case is just the reverse. See PRESBYTA and MYOPS.

From what has been shewn, that every point of an object moves only one point of the bottom of the eye; and, on the contrary, that every point in the fund of the eye only receives rays from one point of the object, it is easy to conceive, that the whole object moves a certain part of the retina;

retina; that in this part there is a diſtinct and vivid collection of all the rays received in at the pupil; and that as each ray carries its proper colour along with it, there are as many points painted in the fund of the eye as there were points viſible in the object. Thus is there a ſpecies, or picture, on the retina, exactly like the object: all the difference between them is, that a body is here repreſented by a ſurface, a ſurface frequently by a line, and a line by a point; that the image is inverted, the right-hand anſwering to the left of the object, &c. and that it is exceedingly ſmall; and ſtill the more ſo, as the object is more remote.

What we have ſhewn, under other articles, of the nature of light and colours, readily accounts for this painting of the object on the retina. The matter of fact is proved by an eaſy experiment, long ſince tried by Des Cartes, thus: the windows of a chamber being ſhut, and light only admitted at one little aperture; to that aperture apply the eye of ſome animal newly killed, having firſt dexterouſly pulled off the membranes that cover the bottom of the vitreous humour, *viz.* the hind part of the ſclerotica, choroides, and even part of the retina; then will the images of all the objects, without doors, be ſeen diſtinctly painted on any white body, as on an egg-ſhell, that the eye is laid upon. And the ſame thing is better ſhewn by an artificial eye, or a camera obſcura.

The images of objects, then, are repreſented on the retina; which is only an expanſion of the fine capillaments of the optic nerve, and from which the optic nerve is continued into the brain. Now, any motion or vibration, impreſſed on one extreme of the nerve, will be propagated to the other: hence the impulſe of the ſeveral rays, ſent from the ſeveral points of the object, will be propagated as they are on the retina, (*i. e.* in their proper colours, &c. or in particular vibrations, or manners of preſſure, correſponding thereto,) to the place where thoſe capillaments are interwoven into the ſubſtance of the brain. And thus is viſion brought to the common caſe of ſenſation.

For ſuch, we know, is the law of the union between the ſoul and body, that certain perceptions of the firſt do neceſſarily follow certain motions of the laſt; but the different parts of the object do ſeparately move different parts of the fund of the eye; and thoſe motions are propagated to the ſenſory: it follows, therefore, that there muſt ariſe ſo many diſtinct ſenſations at the ſame time. See SENSATION.

Hence, 1. We eaſily conceive, that the perception, or image, in the mind, muſt be the clearer, and more vivid, the more rays the eye receives from the object; and conſequently, the largeneſs of the pupil will have ſome ſhare in the clearneſs of viſion.

2. Conſidering only one radiant point of an object, we may ſay, that that point would move the ſenſe more weakly, or be ſeen more obſcurely, as it is more remote; becauſe the rays coming from any point, like all qualities propagated *in orbem*, are always diverging; and therefore the more remote, the fewer of them will be received in at the pupil. But the pupil dilating itſelf more, as the object is more remote, takes in more rays than it would otherwiſe do.

3. The diſtinctneſs of viſion is ſomewhat concerned in the ſize of the image exhibited in the fund of the eye. For there ſhould be, at leaſt, as many extremes of capillaments, or fibres of the optic nerve, in the ſpace that image poſſeſſes, as there are particles in the object that ſend rays into the pupil; otherwiſe every particle will not move its ſeparate capillament; and if the rays from two points fall on the ſame capillament, it will be the ſame as if only one point had fallen there; ſince the ſame capillament cannot be differently moved at the ſame time. And hence it is, that the images of very remote objects being very ſmall, they appear confuſed, ſeveral points of the image affecting each capillament; and hence, alſo, if the object be of different colours, ſeveral particles affecting the ſame capillament at the ſame time, only the brighteſt and moſt lucid will be perceived. Thus, a field, furniſhed with a good number of white flowers, among a much greater quantity of green graſs, &c. at a diſtance, appears all white. See *Diſtinct* VISION, infra.

Our ſeeing of objects *ſingle*, though with two eyes, in each of which is a ſeparate image, or picture; and our ſeeing of them *erect*, whereas the picture is really inverted, are two great phenomena in viſion; which we have conſidered under the article SEEING.

For the manner of ſeeing and judging of the diſtance and magnitude of objects, ſee VISIBLE, MAGNITUDE, &c.

VISION, in *Optics*. The laws of viſion, brought under mathematical demonſtrations, make the ſubject of *Optics*, (which ſee,) taken in the greateſt latitude of that word: for, among the writers of mathematics, optics is generally taken, in a more reſtrained ſignification, for the doctrine of *direct* viſion; catoptrics, for the doctrine of *reflected* viſion; and dioptrics, for that of *refracted* viſion.

VISION, *Direct* or *Simple*, is that performed by means of direct rays; that is, of rays paſſing directly, or in right lines, from the radiant point of the eye. Such is that explained in the preceding article, VISION.

VISION, *Reflected*, is that performed by rays reflected from ſpecula, or mirrors. The laws of this kind of viſion, ſee under REFLECTION, and MIRROR.

VISION, *Refracted*, is that performed by means of rays refracted, or turned out of their way, by paſſing through mediums of different denſity; as air and water, and chiefly through glaſſes and lenſes. The laws of this, ſee under the article REFRACTION.

VISION, *Arch of*. See ARCH.

VISION, *Diſtinct*, denotes that by which an object is ſeen diſtinctly. An object is ſaid to be ſeen diſtinctly, when its outlines appear clear and well defined, and the ſeveral parts of it, if not too ſmall, are plainly diſtinguiſhable, ſo that we can eaſily compare them one with another, in reſpect to their figure, ſize, and colour.

In order to ſuch diſtinct viſion, it has hitherto been commonly thought, that all the rays of a pencil, flowing from a phyſical point of an object, muſt be exactly united in a phyſical, or, at leaſt, in a ſenſible point of the retina. But it ſeems certain, from the experiments mentioned by Dr. Jurin, that ſuch an exact union of rays is not always neceſſary to diſtinct viſion.

Hence the doctor divides diſtinct viſion into two ſpecies, *viz.* into viſion *perfectly diſtinct*, or *perfect* viſion, and viſion *imperfectly diſtinct*; which he calls ſimply by the name of *diſtinct* viſion. The former is that in which the rays of each pencil are collected into a ſingle phyſical, or ſenſible point of the retina; the other ſpecies is that in which thoſe rays occupy ſome larger ſpace upon the retina, yet ſo as the object is diſtinctly perceived.

Perfect viſion in a given eye, and a given diſpoſition of that eye, depends only upon the diſtance of the object; it has no dependence upon the magnitude of the object; but *diſtinct* viſion, in a given eye, and a given diſpoſition of the eye, depends upon the diſtance and magnitude of the object jointly. There appearing, therefore, a real difference between *perfect* viſion, and what we call *diſtinct* viſion, the learned doctor has enquired very particularly into the reaſon why an object may be ſeen diſtinctly without perfect viſion.

He shews that objects may be seen with sufficient distinctness, though the pencils of rays issuing from the points of them do not unite precisely in the same point on the retina; but that since, in this case, pencils from every point, either meet before they reach the retina, or tend to meet beyond it, the light that comes from them must cover a circular spot upon it, and will, therefore, paint the image larger than perfect vision would represent it. Whence it follows, that every object, placed either too near, or too remote for perfect vision, will appear larger than it is by a penumbra of light, caused by the circular spaces, which are illuminated by pencils of rays proceeding from the extremities of the object. All the varieties occasioned by this circumstance he traces with great accuracy, and he applies his observations upon it to the explanation of many phenomena in vision. See *Circle of* DISSIPATION.

Dr. Jurin observes, that when objects are large, they will appear tolerably distinct at a much less distance than small objects, because the penumbræ will not interfere so much; and on this account, a large print may be read much nearer to the eye than a small one. In this case the former will appear only ill defined, but sufficiently distinct, when the latter is quite indistinct, the penumbra of one letter interfering with that of another, and thereby making marks altogether unlike any that are in the book. The dispersed light of these penumbræ, he says, is of different densities; and Mr. Robins, in his Remarks on Dr. Jurin, p. 279, observes, that the whole circle made by the confused image of any print, will be proportioned to the diameter of the pupil of the eye, which limits the whole pencil.

The smallest distance of perfect vision, or that in which the rays of a single pencil are collected into a physical point on the retina in the generality of eyes, Dr. Jurin, from a number of observations, states at five, six, or seven inches. The greatest distance of distinct and perfect vision he found to be more difficult to determine; but by considering the proportion of all the parts of the eye, and the refractive power of each, together with the interval that may be discerned between two stars, the distance of which is known, he fixes it, in some cases, at fourteen feet five inches, though Dr. Porterfield had confined it to twenty-seven inches only, with respect to his own eye.

When vision is indistinct, Dr. Jurin thinks that there are two methods of rendering it distinct. One is for the eye to apply the same power, by which it conforms itself to the view of objects placed at different distances, so as to obtain perfect vision; and the other is the contraction of the pupil by the lesser muscular ring of the uvea, which is chiefly made use of in a strong light, and which will sometimes render the other means altogether unnecessary. In a weak light, he says, the pupil is so far from contracting, that there is rather a necessity for dilating it, to take in more light. But upon this Dr. Whytt (Ess. on vital and involuntary Motions, p. 133.) observes, that in the same, or a less degree of light, the pupil will be contracted, in order to view a nearer or a smaller object. For other observations on this subject, see Jurin's Ess. on distinct and indistinct Vision, at the end of Dr. Smith's Optics; and Robins's Remarks on Dr. Jurin, in his Math. Tracts, vol. ii. p. 278, &c.

VISION, *Field of.* See FIELD.

VISION, among *Divines*, is used for an appearance, which God occasionally sent to his prophets and saints; either by way of dream, or in reality.

Such were the visions of Ezekiel, Amos, &c.; the vision of St. Paul, lifted up to the third heaven, &c.; of Joseph, by which he was assured of the purity of the Virgin, &c.

Some have represented our blessed Lord's temptation in the wilderness, Matt. v. 1, &c. as a vision. Mr. Farmer, in particular, considers it as a divine vision, representing the trials he was to endure, and designed to prepare him for encountering and vanquishing them. See TEMPTATION.

Many among the Romish saints have pretended to visions: as St. Theresa, St. Bridget, St. Catharine de Sienna, &c.

Hence the word has come into disrepute, and become a common name for all chimeras, or spectres, which either our folly or fear possesses us with: and hence, a person that frames to himself wild romantic notions, is called a *visionary*. Quevedo's Visions are descriptions of what passed in the imagination of that author.

VISION, *Beatific*, denotes the act by which the angels and blessed spirits see God in Paradise.

VISIR, VISIER, or *Vizier*. See VISIER.

VISITATION, VISITATIO, an act of jurisdiction, by which a superior or proper officer visits some corporation, college, church, or other public or private house, to see that their respective laws and regulations be duly observed.

Among us, the bishop of each diocese is obliged to hold a visitation every third year, and the archdeacon the other two years; to see that the discipline be well observed, the people well instructed, and to take care that neither the church, nor the pastors of it, receive any detriment. For the first 600 years after Christ, the bishops in their own persons visited all the parishes within their respective dioceses every year; but since the law and practice of triennial visitations have been established, the bishop is not only not obliged by law to visit annually, but he is restrained from it.

The business of parochial visitation, in order to inspect and take account of the fabrics and mansions, ornaments and utensils, vestments and books of the church, peculiarly belongs to the archdeacon. In all visitations of parochial churches made by bishops and archdeacons, the law hath provided, that the charge of them shall be defrayed by the procurations then due, and payable by the inferior clergy; in which custom, as to the quantum, shall prevail. These procurations are due to the person visiting of common right; and although originally due by reason of visitation only, yet the same may be due without actual visitation. They are suable only in the spiritual court, and are merely an ecclesiastical duty; and they may be levied by sequestration, or other ecclesiastical process. Free chapels and donatives (unless such donative hath received the augmentation of queen Anne's bounty) are exempt from the visitation of the ordinary, and of course pay no procurations; the first being visitable only by commission from the king, and the second by commission from the donor. And there are also other churches and chapels exempted, which belonged to the monasteries; which by 25 Hen. VIII. c. 21. were made visitable by the king, or by commission under the great seal.

Anciently the regarder's office was expressed to be the *visitation of manners.* See REGARDER.

The lawyers hold it a branch of the king's prerogative, to visit the universities; to enquire into the statutes, and the observation of them; to expel delinquents, &c. But some of the colleges disallow this privilege, and plead themselves, by royal charters, exempt from all civil and royal visitations.

With regard to all ecclesiastical corporations, the ordinary is their visitor, so constituted by the canon law, and thence derived to us. The pope formerly, and now the king, as supreme ordinary, is the visitor of the archbishop or metropolitan: the metropolitan has the charge and coercion of all his

his suffragan bishops; and the bishops in their several dioceses are in ecclesiastical matters the visitors of all deans and chapters, of all parsons and vicars, and of all other spiritual corporations. With respect to all lay corporations, the founder, his heirs or assigns, are the visitors, whether the foundation be civil or eleemosynary; for in a lay corporation the ordinary neither can nor ought to visit. In general, the king being the sole founder of all civil corporations, and the endower the perficient founder of all eleemosynary ones, the right of visitation of the former results to the king, and of the latter to the patron or endower. The king being constituted by law the visitor of all civil corporations, the law has also appointed the place in which he shall exercise this jurisdiction; which is the court of king's bench, where, and where only, all misbehaviours of this kind of corporations are enquired into and redressed, and all their controversies decided. Accordingly this is the meaning of lawyers, when they say that these civil corporations are liable to no visitation; *viz.* that the law having by immemorial usage appointed them to be visited and inspected by the king their founder, in his majesty's court of king's bench; according to the rules of common law they ought not to be visited elsewhere, or by any other authority.

As to eleemosynary corporations, by the dotation the founder and his heirs are of common right the legal visitors, to see that property is rightly employed, which might otherwise have descended to the visitor himself: but if the founder has appointed and assigned any other person to be visitor, then his assignee so appointed is invested with all the founder's power, in exclusion of his heir. Eleemosynary corporations are chiefly hospitals, or colleges in the university. With regard to hospitals, it has long been held, that if the hospital be spiritual, the bishop shall visit; but if lay, the patron. This right of lay patrons was indeed abridged by 2 Hen. V. cap. 1. which ordained, that the ordinary should visit *all* hospitals founded by subjects: though the king's right was reserved, to visit by his commissioners such as were of royal foundation. But the subject's right was in part restored by stat. 14 Eliz. cap. 5. which directs the bishop to visit such hospitals only, when no visitor is appointed by the founders of them; and all the hospitals founded by virtue of the stat. 39 Eliz. c. 5. are to be visited by such persons as shall be nominated by the respective founders. But still, if the founder appoints nobody, the bishop of the diocese must visit. Colleges in the universities were formerly considered by the popish clergy, under whose direction they were, as ecclesiastical, or at least as clerical, corporations; and therefore the right of visitation was claimed by the ordinary of the diocese. In some of our colleges, where no special visitor is appointed, the bishop of that diocese, in which Oxford was formerly comprised, has immemorially exercised visitorial authority; which can be ascribed to nothing else but his supposed title as ordinary to visit this, among other ecclesiastical foundations. And it is not impossible, that the number of colleges in Cambridge which are visited by the bishop of Ely, may in part be derived from the same original. But whatever might be formerly the opinion of the clergy, it is now held as established common law, that colleges are lay corporations, though sometimes totally composed of ecclesiastical persons; and that the right of visitation does not arise from any principles of the canon law, but of necessity was created by the common law. In a disputed case it was held by lord chief justice Holt, that by the common law the office of the visitor is to judge according to the statutes of the college, and to expel and deprive upon just occasions, and to hear all appeals of course; and that from him, and him only, the party grieved ought to have redress; the founder having reposed in him so entire a confidence, that he will administer justice impartially, that his determinations are fixed, and examinable in no other court whatsoever.

To this leading case all subsequent determinations have been conformable. But where the visitor is under a temporary disability, then the court of king's bench will interpose, to prevent a defect of justice. Also it is said, that if a founder of an eleemosynary foundation appoints a visitor, and limits his jurisdiction by rules and statutes, if the visitor in his sentence exceeds those rules, an action lies against him; but otherwise, where he mistakes in a thing within his power. Blackst. Comm. book i.

Among the Romanists, the general of each religious order is obliged to visit the several monasteries of his order.

In abbeys, that are chiefs of their orders, there are particular officers, called visitors; who are dispatched into all the houses and congregations depending on them, to see that the regular discipline is observed.

In Spain there is a visitor, and inquisitor-general. The visitation of the cloister belongs to the ordinary.

VISITATION, in a moral and religious sense, is also applied to the afflictions that befall mankind; as coming from the hand of God, to try or prove them. In which sense, the plague, among us, is frequently called the *visitation*.

VISITATION *of the Virgin Mary*, is a feast instituted in memory of the visit paid by the Virgin to Elizabeth, first established by Bonaventure, general of the order of St. Francis, by a decree of the general chapter, comprehending the churches of his own order, held at Pisa in 1263; and afterwards extended to the whole church, by pope Urban IV. in the year 1379, and ordained to be kept on the 2d of July.

VISITATION is likewise an order of monks founded by Francis de Sales and his mother Chantalia.

VISITORS. See VISITATION, supra.

VISITORS *of the Inquisition*. See INQUISITION.

VISITZ, in *Geography*, a town of Austria; 4 miles S.E. of Bavarian Waidhoven.

VISIVE, VISIVUS, in the *School Philosophy*, a term applied to the power of *seeing*. See VISION.

Authors are exceedingly divided about the place where the visive faculty resides: some will have it in the retina; others, in the choroides; others, in the optic nerve; others, as sir Isaac Newton, in the place where the optic nerves meet, before they come to the brain; and others, in the brain itself.

VISKAIA, in *Geography*, a fort of Russia, in the government of Upha; 64 miles W.S.W. of Tcheliabinsk.

VISKAIA, *Ust*, a fort of Russia, in the government of Upha, near the Tobol; 88 miles S.E. of Tcheliabinsk.

VISMEA, in *Botany*, received its name from the younger Linnæus, who erroneously called it *Visnea*, in honour of Mr. De Visme, a merchant at Lisbon. Willdenow retains the latter orthography; Schreber, better instructed, uses the former. This name, though not rumbling with consonants, like some with which our science is encumbered, is nevertheless most irreconcileable to Latin pronunciation; nor ought such to be admitted, but when supported by the highest possible pretensions, which in this case are not conspicuous. The worthy Masson, personally informed on the subject, used vehemently to exclaim against the above name, and the French botanists have preferred its barbarous synonym *Mocanera*, by which the shrub in question is known in the Canary islands. Mr. De Visme, it seems, was a mere amateur; but as he endeavoured to diffuse a taste for plants among the Portuguese, who were previously little disposed to any such elegancies, or to any thing useful or praiseworthy

in their stead, we cannot but think him full as deserving of commemoration as many of our own horticulturists, who do but follow a fashion, and therefore are not entitled to literary honours, in a science which they perhaps "ignorantly worship." If they study its principles, they rank as botanists, and render eminent services to those who have not the means of promoting the same pursuit in the same way.—Linn. Suppl. 36. Schreb. Gen. 327. Willd. Sp. Pl. v. 2. 926. Mart. Mill. Dict. v. 4. Lamarck Dict. v. 4. 208. (Mocanera; Juss. 318.)—Class and order, *Dodecandria Trigynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagræ*, Juss.

Gen. Ch. *Cal.* Perianth half superior, of five lanceolate, recurved, permanent leaves, the three outermost hairy. *Cor.* Petals five, equal, elliptical, undivided, spreading, longer than the calyx. *Stam.* Filaments twelve, inserted into the receptacle of the flower, erect, thread-shaped, shorter than the petals; anthers erect, quadrangular, each tipped with a bristle. *Pist.* Germen half inferior, hairy, taper-pointed; styles three, thread-shaped, smooth; stigmas simple. *Peric.* Nut ovate, pointed, smooth, of two or three cells, half inferior, coated, or covered, above half way up, with what might be called the tube of a monophyllous calyx, and surrounded with its converging segments. *Seeds* solitary.

Ess. Ch. Calyx half inferior, of five leaves. Petals five. Stigmas simple. Nut of two or three cells, coated below. Seeds solitary.

1. V. *Mocanera*. Linn. Suppl. 251. Willd. n. 1.—Gathered by Mr. Masson, in the mountainous woods of the Canary islands. A small shrub, with a round, rugged, or somewhat warty, *stem*. *Leaves* alternate, erect, on short stalks, coriaceous, elliptical, veiny, serrated, very smooth. *Flower-stalks* axillary, solitary, drooping, scarcely longer than the footstalks, naked, each bearing one small yellow *flower*. After impregnation the *stalks* become erect, the *calyx* closes and thickens, its three outer segments turning brown and hairy. This, the only known species, is a stranger to our gardens.

VISNAGA, Matth. Valgr. v. 1. 477. t. 479. Rivin. Pentap. Irr. t. 84, an herbaceous plant of the south of Europe, is the *Daucus Visnaga* of Linn. Sp. Pl. 348. Gærtner, t. 21, establishes it as a genus by itself. Desfontaines, and the author of this article, in Prodr. Fl. Græc. Sibth. v. 1. 186, have referred the plant to *Ammi*. There is some reason to believe it the γιγγίδιον of Dioscorides. See GINGIDIUM.

VISNAVITRA, in *Biography*. See VISWAMITRA.

VISNE, VISNETUM, in *Law*, a neighbouring place, or a place near at hand. See VENUE.

VISNEA, in *Botany*, Linn. Suppl. 36. See VISMEA.

VISNIZA, in *Geography*, a town of European Turkey, in Moldavia; 30 miles N. of Suczava.

VISO, EL, a town of Spain, in New Castile; 25 miles S.S.E. of Civdad Real.

VISO, a mountain of France, in the department of the Stura, supposed to be one of the highest parts of the Alps.

VISO *Marso*, a town of Naples, in Calabria Citra; 13 miles W.N.W. of Scalea.

VISOKICH, a town of Russia, in the government of Irkutsk, on the Lena; 8 miles N.N.W. of Orlenga.

VISON, a town of France, in the department of the Tanaro; 3 miles E.S.E. of Acqui.

VISONTIUM, in *Ancient Geography*, a town of Hispania Citerior, belonging to the Pelendones. Ptol.—Also, a town of Higher Pannonia, of the number of those which were remote from the Danube.

VISP, in *Geography*, a town of the Vallais, and chief place of a dixain, or tything; 22 miles E. of Sion.

VISPE, or USPE, in *Ancient Geography*, a town belonging to the Saracens, in the vicinity of the Bosphorus of Thrace; and not far from the river Pania. Tacitus says that it was strongly fortified. The Romans besieged it and were repulsed. When they afterwards attacked the place by escalade, the inhabitants sent a deputation to petition for the life of free persons, with an offer of 10,000 slaves. The besiegers rejected these conditions, and revolting at the cruelty of massacring persons who voluntarily surrendered themselves, and imprisoning so great a number of persons, they recurred to the right of war, which exhibits a horrible example of the ferocity of the Romans. They gave the signal for escalade, but afterwards entered into treaty. In consequence of this event, which was attended with the destruction of Vispe, no record of it remains.

VISPELLIONES, among the Romans, were slaves who could not be manumitted.

VISRAVA, in *Mythology*, a name of the Hindoo Plutus, who is more commonly called *Kuvera*; which see. See also VAISRAVA, another mode of pronouncing this name, which is likewise given to the father of Kuvera and of his half-brother Ravena. (See RAVENA.) These two last named half-brothers are also called Paulastya, or Pulastya. Visrava, or Vaisrava, is sometimes named Viswasrava and Visravana.

VISRUTI, one of the three daughters of Swayambhuva, a personage of importance in their fabulous legends. Some notice of him occurs under his name in this work.

VISSE, in *Geography*, a town of the Popedom, in the marquisate of Ancona; 15 miles S. of Camerino.

VISSEGRAD, a town of Bosnia; 40 miles S.E. of Bosnaserai.

VISSEGRAD. See VICEGRAD.

VISSEHOVEDE, a town of Germany, in the county of Verden; 19 miles E. of Verden.

UIST, NORTH, one of the islands of the Hebrides, in the shire of Inverness, Scotland, is of a very irregular shape, and extends in length about twenty miles, and from twelve to eighteen in breadth. The word *Uist* is said to be taken from the Scandinavian word *vist*, which signifies *west*, and was given by the Danes, when in possession of these countries, on account of its westerly situation. The western part of the coast, which is washed by the Atlantic, is inaccessible to vessels, or even to fishing-boats, except in the calmest weather, on account of rocks and shoals. On the eastern coast are several inlets of the sea, which form safe and commodious harbours. Of these, the best is loch Maddie, which affords good anchorage for vessels of any burden. Along the coast round these harbours the ground is barren, hilly, and almost uninhabited. The western and northern parts of the island, almost the only cultivated parts, are low and level for about a mile and a half from the sea, when the surface becomes moory, with hills of small height covered with black heath. It has mostly a sandy soil, which, as it approaches the moorlands, is a thin black loam, on a gravelly, or on a free-stone bottom. In favourable summers, the cultivated parts yield luxuriant crops of oats and barley; but as there are no trees to afford shelter during the inclemency of winter, the appearance is then greatly changed, and verdure is scarcely to be seen; so that the cattle, in these seasons, are fed partly on straw, and partly on sea-weed thrown up by storms. The number of cows kept on the island is about 2000, of which 300 are annually exported; the number of horses is about 1600. Agriculture is in a low state; and the implements of husbandry, with a few exceptions, are the same kind that were used a century past. Here are numerous fresh-water lakes, abounding with excellent trout, and frequented by innumerable

able flocks of aquatic fowls. Kelp is manufactured to a considerable extent, the annual produce being about 1200 tons; of which the greater part belongs to lord Macdonald, the sole proprietor of the island, from which he derives a yearly rent of 2100*l.* sterling, besides the profits of the kelp. A parochial school is established here, from which one scholar is annually sent to the university. The parish of North Uist comprehends several adjacent isles. In the year 1811, the population was estimated at 3773. Here are the remains of several Danish forts: and also of some Druidical temples, which are described by Dr. Smith, in his History of the Druids.—Beauties of Scotland, vol. v. Inverness-shire, 1808. Gazetteer of Scotland, 1806. Carlisle's Topographical Dictionary of Scotland, 1813.

UIST, *South*, another of the Hebrides islands, also included in the shire of Inverness, is in length about thirty miles, and the greatest breadth may be estimated from seven to nine miles; affording an area of about 40,000 acres, capable of cultivation. Towards the west and north-west, where it is bounded by the ocean, the soil is light and sandy, and most part rendered useless by the severity of the storms: further inland is a series of lakes, which abound with a variety of fish; and to the east are high and rugged mountains, covered with heath and a partial degree of verdure, which afford pasturage in the summer and autumn months for black cattle, horses, sheep, and goats; but the grain produced on the island does not serve the inhabitants more than nine months in the year. About 7000 sheep are generally kept here, and about 3000 cows; but the greatest source of emolument (as well as in North Uist) is the manufacture of kelp, to the amount of 1100 tons annually: its first introduction into these islands was in the year 1750, by a Mr. Macleod, who brought it from Ireland, where it had been carried on for several years. The parish of South Uist, which includes some small contiguous isles, contained, in the year 1811, a population of 4825; being more than doubled since the year 1755, notwithstanding numerous emigrations.—Beauties of Scotland, vol. v. Inverness-shire, 1808. Carlisle's Topographical Dictionary of Scotland, 1813. Gazetteer of Scotland, 1806.

VISTAMENTE, in the *Italian Music*, is used to give notice to play or sing quick, briskly, &c.

VISTE, in *Botany*, a name given by some authors to the common white mountain coralloides: it is the Lapland name for the same plant; the rein-deer and many other creatures feeding on it, when all other vegetables are destroyed.

VISTER, in *Geography*, a town of European Turkey, in Bulgaria; 44 miles S.W. of Ismail.

VISTNOU, VISTNUM, or *Vishnu*, in the *Modern History of Mythology*, a name given in the theology of the Brahmins, to one of the three great gods of the first class, which are the objects of worship to the inhabitants of Hindoostan: the other two are *Brahma* and *Ruddiren*.

According to the Vedam, these three gods were created by the Supreme Being, to be his ministers in nature. Brahma is represented as the creator, Vistnou as the preserver, and Ruddiren as the destroyer of beings. However, there are some sects which maintain, that Vistnou is superior to Brahma, and that he gave him existence. Vistnou, it is said, distributed mankind into three classes, the rich, the poor, and those of middle state; and created many worlds, inhabited by spirits destined for the preservation of other beings. Vistnou is most respected in the kingdom of Carnata, Brahma in the Mogul empire, and Ruddiren in Malabar. Un. Hist. vol. vi. 8vo. See VISHNU.

VISTRITZA, in *Geography*, a river of European Turkey, which runs into the Vistriza, 16 miles E.S.E. of Edessa, in Macedonia.

VISTRIZA, a river of European Turkey, in Macedonia, which runs into the Varder, 25 miles N.W. of Saloniki.

VISTULA, a river which rises in the south-east part of Silesia, on the borders of Poland, passes by Cracow, Sandomirz, Zawichost, Warsaw, Wladislaw, Thorn, Culm, &c. and runs into the Baltic, at Dantzic.

VISUAL, something belonging to the sight, or seeing.

VISUAL *Angle*. See ANGLE.

VISUAL *Line*. See LINE.

VISUAL *Point*, in *Perspective*, is a point, in the horizontal line, in which all the ocular rays unite. See POINT.

Thus, a person standing in a straight long gallery, and looking forwards; the sides, floor, and cieling, seem to meet, and touch one another in a point, or common centre.

VISUAL *Rays*, are lines of light, imagined to come from the object to the eye. See RAY.

All the observations of astronomers and geometers are performed by means of the visual rays, received in at the sights, or pinnulæ, or alhidades.

VISUM. See HABERE *facias visum*.

VISURGIS, the *Weser*, in *Ancient Geography*, a very considerable river of Germany; it made a separation between the Romans and Cherusci, according to Pliny, and became celebrated by the defeat of the Roman army on its banks, according to Velleius Paterculus.

VISWADEVA, a sacrifice or oblation offered by pious Hindoos to all their gods collectively. The word means all the gods. "One oblation to the assembled gods, thence named Viswadeva, is ordained both for evening and morning." Inst. of Menu, iii. 121. (See MENU.) Of other sacrifices of the Hindoos, see SRADHA.

VISWAJENNI, in *Mythology*, a name of the Hindoo goddess *Parvati*; which see. It means *all-prolific*, and is applied to her in her character of Prakriti, or nature. See PRAKRITI.

VISWAKARMA, is a personage of considerable importance, and his name frequently occurs in Hindoo books. Sir W. Jones (As. Ref. vol. i.) thinks Viswakarma to be the Vulcan of the Greeks and Romans; being, like Vulcan, the forger of arms for the gods; and inventor of the Agniastra, or fiery shaft, used in the wars between them and the Daityas, or Titans. He is deemed the architect of the universe, and chief engineer of the gods. He revealed the fourth Upaveda in various treatises on sixty-four mechanical arts, for the improvement of such as exercise them; and he is the inspector of all manual labours and mechanical arts. See VEDA.

It is fabled that Viswakarma was employed by Krishna to build for him the city of Dwarka, in Guzerat; and it is not unusual for any very magnificent or stupendous work of antiquity to be attributed to him: the excavations at Ellora, for instance. (See ELLORA.) Between Viswakarma and the Pandus, the labour and honour of the excavations at Ellora, Elephanta, Karly, &c. are shared. See ELEPHANTA, KARLY, and PANDU.

Viswakarma is the reputed son of Bhuvana, and a daughter of his is sometimes mentioned, named Barhismati; but their names seldom occur. A son of the divine artist is named *Viswarupa* (which see), father of the wives of Ganesa, or Pollear. Under our article TARA is a ridiculous, but characteristic legend of Viswakarma having, like most of the other Hindoo deities, begotten an ape! Twashta is another

another name of this divine architect, and also of the sun. See TWASHTA.

VISWAMITRA, in *Biography*, is the name of a very celebrated and sanctified personage in the theological legends of the Hindoos. His age is anterior to authentic research, since his name occurs frequently in the Veda, the Hindoo scriptures, which is professed to have been written thousands of years ago. (See VEDA.) He was the Rishi, (see RISHI,) or saint, to and by whom was revealed the hymn in which is contained the holiest verse of the Veda, called the adorable, the ineffable, Gayatri. (Of this see under O'M.) His grandson, named Yajnyawalcya, is the reputed author of a code or institutes of law that is still in use. It is arranged in three chapters, containing 1023 couplets. The commentaries on it are very voluminous. The name of Viswamitra, which means universal friend, or friend to all, occurs very frequently in Sanscrit writings; and indeed not unfrequently in this dictionary. His self-inflicted austerities, and persevering devotions, are the theme of frequent praise. Under the article MENAKA, the Upsara, "of fascinating symmetry of form," as she is described in the Ramayana, it is noticed how the rigid mortifications of the ascetic were interrupted; and their reward averted by the wiles of that damsel employed by Indra. Under RAMAYANA and UPSARA will be found some account of the work, and of the semi-divine, saint-seducing beauties, severally so called. See also INDRA and RHEMBA, the name of the Venus Marina of the Hindoos, and queen of beauty and of beauties. Viswamitra, though not of Brahma, was the *guru*, or spiritual preceptor of the great Rama; and is the author of much of the moral precept scattered through that curious work the Ramayana; which details the exploits, among much other matter, of its divine hero. (See RAMA.) In the Ramayana, Viswamitra is often called "son of Kasheka;" and occasionally a person named Gadhi, is called his father. The interesting Sakoontala, introduced to the English reader by sir W. Jones's translation of the Hindoo drama of that title, is spoken of as his daughter. Though not a Brahman by birth, he is said to have become one through his devotion.

Under our article SURABHI an anecdote is given of Viswamitra, which, with that alluded to above, tends to shew that he was tainted with the vice of avarice as well as lust. In our article TAREKA he appears as the tutor of his obedient pupil Rama.

VISWASWARA, a name of the Hindoo god *Siva;* which see. It means lord of all; and is probably given to him by the sects who exclusively, or especially worship him, of whom see under SECTS *of Hindoos*. The name does not often occur. In one of the Puranas is this verse. "The Vedas and Sastras all testify that Viswaswara is the first of Devas (or gods), Kashi (Benares) the first of cities, Ganga (the Ganges) the first of rivers, and Charity the first of virtues."

VITA, LIFE. See LIFE.

VITA, *Cui in*. See CUI.

VITÆ, *Aqua*. See AQUA.

VITÆ *Arbor*, in *Anatomy*, the appearance produced by a particular section of the cerebellum. See BRAIN.

VITÆ, *Arbor*. See TREE *of Life*.

VITÆ, *Lignum*. See GUAIACUM.

VITA *Longa*, a name given by some botanical authors to the *piper Æthiopicum*, or Æthiopian pepper.

VITACA, in *Ancient Geography*, a town of Africa, in Mauritania Cæsariensis. Ptol.

VITAL, VITALIS, in *Anatomy*, something that ministers principally to the constituting or maintaining of life in the bodies of animals.

Thus, the heart, lungs, and brain, are called vital parts. See VIS.

VITAL *Air*, in *Agriculture*, *Vegetable Economy*, &c. pure air or oxygen, which is one of the constituent parts of atmospherical air, and of great use in the germination of grain and seeds, and the vegetation and growth of plants, as well as the respiration of animals. But though it is necessary to these and some other functions of vegetables, it is remarked by the writer of a late work on agricultural chemistry, that its great importance in nature is in its relation to the last, or the economy of animals.

It is stated that atmospheric air taken into the lungs of animals, or passed in solution in water through the gills of fishes, loses vital air or oxygen; and that for the vital air or oxygen that is lost, about an equal volume of carbonic acid appears. That the action of the atmosphere on plants differs at different periods of their growth, and varies with the various stages of the developement and decay of their organs, as is evident in the progress of their vegetation and decline. As if a healthy seed be moistened and exposed to the air at a temperature not below 45°, it soon germinates or sprouts; and shoots or sends forth a plume which rises upwards, and a radicle that descends. If the air be confined, it is found that in this process the vital air or oxygen of it, or a part of it, is absorbed. As to the other parts, the azote remains unaltered, and no carbonic acid is taken away from it; on the contrary, some is added. Grain and seeds are incapable of germinating or sprouting, except when vital air or oxygen is present. In the exhausted receiver of the air-pump, in pure azote, and in pure carbonic acid, when moistened they swell, but do not vegetate; and if kept in these gases, lose their living powers, and undergo putrefaction. If a grain or seed be examined before germination, it will be found more or less insipid, or at least not sweet; but after germination, or the act of sprouting, it is always sweet. Its coagulated mucilage, or starch, is converted into sugar in that process; a substance difficult of solution is thus changed into one easily soluble; and the sugar carried through the cells or vessels of the cotyledons of the grain or seeds, is the nourishment of the infant plant.

It is noticed that the absorption of vital air or oxygen by the grain or seed in germination, or the operation of sprouting, has been compared to its absorption in producing the evolution of fœtal life in the egg; but that this analogy is only remote. All animals, from the most complete to the least perfect classes, require, it is said, a supply of vital air or oxygen for their production and evolution. From the moment the heart begins to pulsate until it ceases to beat, the aeration of the blood, or the supply of this sort of air, is constant, and the function of respiration invariable; carbonic acid is given off in the process, but the chemical change produced in the blood is unknown; nor is there any reason to suppose the formation of any substance similar to sugar. In the production of a plant from a grain or seed, some reservoir of nourishment is needed before the root can supply sap for it; and this reservoir is the cotyledon, in which it is stored up in an insoluble form, and protected if necessary during the winter, and rendered soluble by agents which are constantly present on the surface. The change of starch into sugar, connected with the absorption of vital air or oxygen, may rather, it is supposed, be compared to a process of fermentation than to that of respiration; it is a change effected upon an organized matter, and can be artificially

tificially imitated; and in moſt of the chemical changes that take place when vegetable compounds are expoſed to air, oxygen or vital air is abſorbed, and carbonic acid formed or evolved. Much advantage may be taken of this in the ſowing of different kinds of grain and ſeeds, and in the tillage cultivation of different ſorts of land, as well as in different other practices and proceſſes; the former not being done too deeply in any caſe, nor the latter too lightly in ſtiff tenacious ſoils. See TILLAGE.

When the roots and leaves of the infant plant are formed, the cells and tubes throughout its ſtructure become, it is ſaid, filled with fluid, which is uſually ſupplied from the ſoil of the land, and the function of nouriſhment is performed by the action of its organs upon the external elements. The conſtituent parts of the air are ſubſervient to this proceſs; but, as might be expected, they act differently under different circumſtances, it is thought. When a growing plant, the roots of which are ſupplied with a proper nouriſhment, is expoſed in the preſence of ſolar light to a given quantity of atmoſpherical air, containing its due proportion of carbonic acid, the carbonic acid after a certain time is deſtroyed, and a certain quantity of vital air or oxygen is found in its place. If new quantities of carbonic acid gas be ſupplied, the ſame reſult occurs; ſo that carbon is added to plants from the air by the proceſs of vegetation in ſun-ſhine; and vital air or oxygen is added to the atmoſphere, as proved by the experiments of Prieſtley, Ingenhouſz, and many others more lately. The abſorption of carbonic acid gas, and the production of vital air or oxygen, are performed by the leaf; and leaves recently ſeparated from the tree or plant effect the change, when confined in portions of air containing carbonic acid; and abſorb the ſame acid, and produce vital air or oxygen, even when immerſed in water holding carbonic acid in ſolution. It is ſuppoſed that this acid is probably abſorbed by the fluids in the cells of the green or parenchymatous part of the leaf; and that it is from this part that vital air or oxygen gas is produced during the preſence of light. M. Sennebier, it is ſaid, found that the leaf, from which the epidermis was ſtripped off, continued to produce vital air or oxygen when placed in water containing carbonic acid gas, and that the globules of air roſe from the denuded parenchyma; and it is ſhewn, by the experiments of the ſame writer as well as thoſe of Woodhouſe, that the leaves moſt abundant in parenchymatous parts produced moſt vital air or oxygen in water impregnated with carbonic acid. Some few plants, it is ſaid, will vegetate in an artificial atmoſphere, conſiſting principally of carbonic acid; and many will grow for ſome time in air containing from one-half to one-third; but they are not ſo healthy as when ſupplied with ſmaller quantities of this elaſtic ſubſtance. Plants expoſed to light have been found to produce vital air or oxygen gas in an elaſtic medium, and in water containing no carbonic acid gas; but in quantities much ſmaller than when that acid gas was preſent. In the dark, no vital air or oxygen gas is produced by plants, whatever be the elaſtic medium to which they are expoſed; and no carbonic acid abſorbed. In moſt caſes, on the contrary, vital air or oxygen gas, if it be preſent, is abſorbed, and carbonic acid gas is produced. In the changes that take place in the compoſition of the organized parts, it is ſuppoſed probable that ſaccharine compounds are principally formed during the abſence of light; gum, woody fibre, oils, and reſins during its preſence; and that the evolution of carbonic acid gas, or its formation during the night, may be neceſſary to give greater ſolubility to certain compounds in the plant. It was once ſuſpected that all the carbonic acid gas produced by plants in the night, or in ſhade, might be owing to the decay of ſome part of the leaf, or epidermis; but the late experiments of Mr. D. Ellis are oppoſed to this notion; and it was found that a perfectly healthy plant of celery, placed in a given portion of air for a few hours only, occaſioned a production of carbonic acid gas, and an abſorption of vital air or oxygen.

It has been ſuppoſed by ſome, it is ſaid, that plants expoſed in the free atmoſphere to the viciſſitudes of ſun-ſhine and ſhade, light and darkneſs, conſume more vital air or oxygen than they produce, and that their permanent agency upon air is ſimilar to that of animals; and this opinion is countenanced by the inquiries on vegetation of the writer juſt noticed. But the whole of the experiments brought forward in favour of this notion, and particularly thoſe of this writer, have, it is ſaid, been made under unfavourable circumſtances to the accuracy of reſult. The plants have been confined and ſupplied with food in an unnatural manner; and the influence of light upon them has been very much diminiſhed by the nature of the media through which it paſſed. Plants confined in limited portions of atmoſpheric air ſoon become diſeaſed; their leaves decay, and by their decompoſition they rapidly deſtroy the vital air or oxygen of the air. In ſome of the early experiments of Prieſtley, before he was acquainted with the agency of light upon leaves, air, it is ſaid, that had ſupported combuſtion and reſpiration, was found purified by the growth of plants when they were expoſed in it for ſucceſſive days and nights; and his trials are the more unexceptionable, it is thought, as the plants, in many of them, grew in their natural ſtates; and ſhoots, or branches from them, only were introduced through water into the confined atmoſphere. And ſome further reſearches on this ſubject made by the able writer of the work on agricultural chemiſtry noticed above, furniſh facts which confirm the popular opinion, that when the leaves of vegetables perform their healthy functions, they tend to purify the atmoſphere in the common variations of weather, and changes from light to darkneſs.

In germination, and at the time of the decay of the leaf, vital air or oxygen muſt, it is ſaid, be abſorbed; but when it is conſidered how large a part of the ſurface of the earth is clothed with perennial graſſes, and that half of the globe is always expoſed to the ſolar light, it appears by far the moſt probable opinion, that more vital air or oxygen is produced than conſumed during the proceſs of vegetation; and that it is this circumſtance which is the principal cauſe of the uniformity of the conſtitution of the atmoſphere. Animals produce no vital air or oxygen gas during the exerciſe of any of their functions, and they are conſtantly conſuming it; but the extent of the animal, compared to that of the vegetable kingdom, is, it it ſaid, very ſmall; and the quantity of carbonic acid gas produced in reſpiration, and in various proceſſes of combuſtion and fermentation, bears a proportion extremely minute to the whole volume of the atmoſphere: if every plant during the progreſs of its life makes a very ſmall addition of vital air or oxygen to the common air, and occaſions a very ſmall conſumption of carbonic acid, the effect may, it is ſuppoſed, be conceived adequate to the wants of nature.

It is ſuppoſed that it may occur as an objection to theſe views, that if the leaves of plants purify the atmoſphere, towards the end of autumn, and through the winter and early ſpring, the air in our climates muſt become impure, the vital air or oxygen in it diminiſh, and the carbonic acid gas increaſe, which is not the caſe: but there is a very ſatisfactory anſwer, it is ſaid, to this objection; the different parts of the atmoſphere are conſtantly mixed together by winds,

winds, which, when they are ftrong, move at the rate of from fixty to a hundred miles in an hour. In our winter, the fouth-weft gales convey air, which has been purified by the vaft forefts and favannas of South America, and which, paffing over the ocean, arrives in an uncontaminated ftate. The ftorms and tempefts which often occur at the beginning and towards the middle of our winter, and which generally blow from the fame quarter of the globe, have a falutary influence. By conftant agitation and motion, the equilibrium of the conftituent parts of the atmofphere is preferved; it is fitted for the purpofes of life: and thofe events, which the fuperftitious formerly referred to the wrath of heaven, or the agency of evil fpirits, and in which they faw only diforder and confufion, are, it is faid, demonftrated by fcience, to be miniftrations of divine intelligence, and connected with the order and harmony of our fyftem.

The clofe analogy which fome have fuppofed to exift between the abforption of vital air or oxygen, and the formation of carbonic acid gas in germination, and in the refpiration of the fœtus, has been already contended againft; and fimilar arguments will, it is faid, apply againft the purfuit of this analogy, between the functions of the leaves of the adult plant, and thofe of the lungs of the adult animal; feveral of which are ingenioufly ftated: and it is concluded, that the functions of the leaf muft vary according to the compofition of the fap paffing through it; and according to the nature of the products which are formed from it. When fugar is to be produced, as in early fpring at the time of the developement of the buds and flowers, it is probable that lefs vital air or oxygen will be given off, than at the time of the ripening of the feed, when ftarch, or gums, or oils, are formed; and the procefs of ripening the feed ufually takes place when the agency of the folar light is moft intenfe. When the acid juices of fruits become faccharine in the natural procefs of vegetation, more vital air or oxygen, there is every reafon to believe, it is faid, muft be given off, or newly combined, than at other times; for all the vegetable acids contain more vital air or oxygen than fugar. It appears probable, it is faid, that in fome cafes, in which oily and refinous bodies are formed in vegetation, water may be decompofed, its vital air or oxygen fet free, and its hydrogen abforbed. When the leaves of fome plants, and particularly fuch as produce volatile oils, are expofed in water faturated with vital air or oxygen gas, this air or oxygen is given off in the folar light; but the quantity is very fmall, and always limited; and the writer has not been able to afcertain with certainty, whether the vegetative powers of the leaf were concerned in the operation, though it feems probable. In all cafes in which buds are formed, or fhoots thrown forth from roots, vital air or oxygen appears to be uniformly abforbed, as in the germination or fprouting of grain and feeds. This was fatisfactorily fhewn by trial with the potatoe, which, when placed in proper circumftances, foon threw forth a fhoot, which, when half an inch long, had nearly abforbed a cubical inch of vital air or oxygen, and formed about three-fourths of a cubical inch of carbonic acid. There was a fweet tafte in the juices of the fhoot, when feparated from the root; and the abforption of vital air or oxygen, and the production of carbonic acid, were probably, it is thought, connected with the converfion of a portion of ftarch into fugar. As frozen roots of this kind become fweet when thawed, vital air or oxygen may probably, it is fuppofed, be abforbed in this operation, and if fo, the change may be prevented by thawing them out of the contact of air; as under water lately in the boiling ftate. See AIR, &c.

Thefe and different other ftatements that may be feen in the work noticed above, fhew the great importance of vital air or oxygen in the ways that have been mentioned in the beginning of this article, as well as in the economy of vegetables, and for other purpofes.

VITAL *Functions*, or *Actions*, are thofe operations of the vital parts by which life is affected; fo as that it cannot fubfift without them.

Such are the mufculous action of the heart, the fecretory action in the cerebellum, the refpiratory action of the lungs; and the circulation of the blood and fpirits through the arteries, veins, and nerves. See FUNCTION and ACTION.

VITAL *Principle*, or *Subftance*, denotes a kind of agent or inftrument, fuppofed by Dr. Grew to be employed under the direction and in fubordination to the will of the Creator, in the production of plants, animals, &c.

This principle correfponds to the plaftic nature of Dr. Cudworth. The fuppofed exiftence of thefe principles produced a difpute between M. Bayle and M. Le Clerc, which the former conceived to favour atheifm, though he allows that neither Dr. Cudworth nor Dr. Grew were aware of the confequence; but the latter maintains, that the plaftic or vital natures, admitted by thefe writers, cannot in the leaft favour the atheifts, becaufe they are only inftruments in the hand of God, and have no efficacy but what they receive from him, who directs and rules all their actions. Of this difpute Dr. Warburton obferves, that Cudworth's plaftic life of nature is fully overthrown by Bayle, whofe fuperiority in the controverfy with Le Clerc is clear and indifputable. See Grew's Cofmologia Sacra, fol. 1701. p. 31, &c.; and Cudworth's Life, prefixed to Birch's edition of the Intellectual Syftem, vol. i. p. 15, &c.

VITAL *Spirits* are the fineft and moft volatile parts of the blood. See SPIRITS.

VITALBA, in *Botany*, a name given by fome authors to the viorna, or traveller's joy. See VIORNA.

VITALIA, a name given by fome authors to the cardiac medicines.

VITALIANUS, in *Biography*, pope, was born at Segnia, in Campania, and elevated to the pontificate A.D. 657, on the death of Eugenius. When, according to cuftom, he fent legates to Conftantinople, with his confeffion of faith, to be prefented to the emperor Conftans and his fon Conftantine, the Monothelite doctrine was fafhionable at the imperial court, and, therefore, the pope was very guarded in his communication. In 663 Conftans entered Italy, and advanced towards Rome; and though he was treated with great refpect by Vitalian and his clergy, he was not thus prevented from robbing the churches of all the treafure to which he could have accefs. In 667, Wighard, archbifhop-elect of Canterbury, was fent to Rome to receive ordination from the pope; but as Wighard died of the plague in that capital, the pope, notwithftanding the compliment that was paid him by the Britifh kings, took this opportunity of extending the prerogative of the papacy, and of nominating one Theodore, a monk, to fupply the place of the deceafed prelate. Vitalian, in fome other inftances, manifefted his zeal for the intereft and influence of the Romifh church, and the authority of its vifible head; but after a pontificate of 14½ years, he died in 672. His zeal procured for him a place among the canonized pontiffs. Some letters written by him on ecclefiaftical affairs are ftill extant. Dupin. Bower.

VITALIS, in *Botany*, a name given by fome authors to the common telephium, called the Englifh orpine, and livelong, from its quality of living and flourifhing a long time after it is taken from the root.

VITCHEGDA, in *Geography*, a river of Ruffia, which rifes

rises in the province of Usting, and runs into the Dwina, near Sol Vitchegodsk.

VITE, Timoteo della, da Urbino, in *Biography*, was born at Urbino in 1470. After having some time studied the art of painting at Bologna, under Francesco Francia, he returned, when about 26 years old, to his native country; and thence went to Rome, to his countryman and relation Raffaelle. He there engaged himself to assist that renowned artist, and prepared for him the Sibyls in the church of La Pace, and was permitted by his master to retain the cartoons. He did not remain long at Rome, but returned to Urbino; and there, in conjunction with Girolamo Genga, executed several large works for the cathedral, and other public places.

He brought to Rome a style which was dry and laboured, as of the preceding century, as may be seen in his Madonnas at the palace Bonaventura, in the Capitol at Urbino, and at Pesaro in the Discovery of the Cross. Under Raffaelle he improved his style, and acquired much of his grace, attitudes, and colour; though he always remained a timid inventor, and had a certain weakness of pencil, and was more exact than grand. The Conception at the Osservanti in Urbino, and the Noli me Tangere in the church of S. Angelo at Cagli, are perhaps the best remains of Timoteo. He died in 1524, aged 54.

VITEGRA, in *Geography*, a river of Russia, which runs into lake Onezskoi, near the town of Vitegra.—Also, a town of Russia, in the government of Olonetz, at the south end of lake Onezskoi; 88 miles E. of Olonetz. N. lat. 60° 55′. E. long. 35° 44′.

VITELLIA, in *Ancient Geography*, a town of Italy, in Latium, in the country of the Æqui; it took its name from the family of Vitellius.

Vitellia *Via*, one of the roads of Italy, which led from the Janiculum to the sea.

VITELLIANI, in *Antiquity*, a kind of tablet or pocket-book, in which people anciently used to write down their ingenious, humorous, and even wanton fancies and impertinences; the same with what, in English, we may call a *trifle-book*. See Martial, lib. xiv. epig. 8.

Some will have them to take their name from *vitellus*, a yolk of an egg; because the leaves were rubbed with it. Others derive the name from one Vitellius, their inventor.

VITELLIO, or Vitello, in *Biography*, a Polish mathematician, flourished about the end of the 13th century, as we may infer from the dedication of his work on Optics to the pope's penitentiary, William de Morbeta, who lived about the year 1296. His work, though now of little value, was probably in estimation at the early period in which it was written, as it contained a collection of materials furnished by Euclid, Archimedes, Ptolemy, and Alhazen. It was published together with that of Alhazen under the following title: "Opticæ Thesaurus, Alhazeni Arabis Libri VII. nunc primum editi. Item Vitellonis, Thuringo-poloni, Libri X. omnes instaurati, Figuris illustrati et aucti, adjectis etiam in Alhazenum Commentariis, A. Frederico Risnero," Basiliæ, 1572. fol. Montucla Hist. Math.

VITELLIUS, Aulus, Roman emperor, was born A.D. 16, and resided in his youth at Capreæ, the infamous abode of Tiberius. To Caligula he recommended himself by his skill as a charioteer; and by his passion for play, to Claudius, who made him consul A.D. 48. He likewise presided at the games, in which Nero exposed himself as a musician. At this time Vitellius disgraced himself by his servility and meanness; but in the post of governor of Africa, he obtained some credit. At length, however, he was reduced to indigence by his licentiousness, and was thus led to practise fraud, with regard to the offerings and ornaments of the temples, by substituting base metal for real silver and gold. On the accession of Galba to the empire, A.D. 68, Vitellius was appointed to the command of the legions in Lower Germany; Galba assigning as a reason for this preferment, that a man addicted to gluttony was not to be feared. The German legions were much disaffected to Galba; but Vitellius had contrived to recommend himself to favour. When the day (*viz.* January 1st) arrived, on which the troops were required to renew their oath of fidelity to their emperors, those commanded by Vitellius performed the ceremony reluctantly, and with ill will; but in the army of Upper Germany, two legions openly renounced allegiance to Galba. When this event was communicated to the Lower army, Valens, one of the general officers, came to Cologne, and saluted Vitellius as emperor, who was also recognized under this appellation in other provinces of the empire. At Rome, however, Otho was invested with the imperial dignity, on the murder of Galba; and the two competitors began with negociation, and proceeded to attempts against each other's life. When Otho put an end to his own life, after the defeat of his troops, Vitellius was recognized without opposition at Rome, in April, A.D. 69. One of the first acts, after receiving the news of his accession, was that of conferring knighthood on a vile freedman, named Asiaticus. Although he treated the general officers of Otho's party with a clemency that did him honour, he incurred reproach by the execution of several of the inferior officers, and by ordering the death of Dolabella, on a false accusation. However, stupid insensibility was his predominant foible, rather than a revengeful spirit; and this was the effect of his insatiable and shameful gluttony. His extravagance in indulging his appetite for costly dishes, covered with all the varieties which he could procure, had no bounds. He is said to have consecrated a silver dish, which on account of its size he called the buckler of Minerva, and to have filled it solely with the livers of a small and delicate fish, the brains of peacocks and pheasants, the tongues of flamingoes, and the roes of lampreys. The expences of his table, during eight months of his reign, have been estimated at five millions sterling; but Tacitus states this sum as the cost of all his profusions.

On his way to Rome, he visited the field of battle on which Otho had been defeated; and when he saw it strewed with dead and mangled bodies, he did not manifest the least emotion; and when some of his attendants complained of the stench arising from the uninterred carcases, he had the fool-hardiness to utter this observation, "A dead enemy smells well, especially a dead citizen." He entered Rome with great pomp, at the head of troops that massacred a number of the populace who went out to meet him, and pronounced a panegyric on himself, which was applauded by the servile crowd. He afterwards affected popularity, but his character was so devoid of every virtue, that no act he performed could be thought of any value. "Every evil which Rome had suffered under the worst emperors seemed to be its destiny in the reign of Vitellius." But a deliverance was preparing for the seemingly devoted city. The Eastern army was approaching, and Vespasian was proclaimed emperor. Vitellius was roused from his lethargy, but it was too late; and after the defection of some of his troops, and the defeat of others, he again sunk into his stupefying luxury. Despairing of redress, he determined to abdicate; and with this view negociated with Flavius Sabinus, brother of Vespasian, who was prefect of Rome. The populace, however, whose compassion was excited

excited by the mournful habit and distressing circumstances in which he left the palace, obliged him to return. Upon this the city-guards attacked Sabinus, who had fought refuge for himself and his adherents in the Capitol. The partisans of Vitellius, yielding to the impulse that had been excited, stormed this sacred place, and in the tumult the temple of Jupiter Capitolinus was consumed by fire. Sabinus was seized, and carried before Vitellius, who wanted to save him; but he was massacred in the most ignominious manner. These outrages were in a little while dreadfully revenged. The victorious army approached the city; and the Vitellian soldiers, well apprized that no mercy awaited them, made a desperate resistance; so that Rome, in the midst of the licentious festivities of the Saturnalia celebrated at this time, was a scene of slaughter and blood. Vitellius took no part in this business, but withdrew to the house of his wife on mount Aventine; from hence he removed again to the palace, and was at length found in the porter's lodge, intreating in the most abject manner that his life might be spared. But all his intreaties were ineffectual. With his hands tied behind him, and a cord about his neck, he was dragged like a common criminal in the midst of insults of every kind. Having escaped the murderous aim of a German soldier, he was at length taken to the Gemonian stairs, down which the body of Sabinus had been thrown, and being dispatched in a barbarous manner, his head was cut off, and stuck upon a spear, to be carried through the city, and his trunk was thrown into the Tiber. Thus he closed a short and ignominious reign in the 55th year of his age, A.D. 69. Suetonius. Tacitus. Crevier. Gen. Biog.

VITEPSK, in *Geography*, a town of Russia, in the government of Polotsk, on the Duna, taken from Poland in the year 1654; 56 miles E.S.E. of Polotsk. N. lat. 55° 15′. E. long. 30° 50′.

VITERBO, a town of the Popedom, and capital of the Patrimonio, given by the empress Matilda to the pope; in memory of which donation, an inscription, on stone, is put up on the town-house. This city lies in a beautiful and fertile valley, is large, the streets, for the greater part, broad and well paved, the houses good, but thinly peopled, the number of the inhabitants being scarcely 15,000, though that of the churches, convents, and hospitals, is not less than 69. The bishop is immediately under the pope. Four popes lie interred in the cathedral. Not far from the city is a warm mineral spring; 34 miles N.N.W. of Rome. N. lat. 42° 25′. E. long. 12° 6′.

VITES, in *Botany*, the seventy-second natural order in Jussieu's system, the twelfth of his thirteenth class, is so called from *Vitis*, one of its genera. For the characters of this class, see GERANIA. The order, which consists of *Cissus* and *Vitis* only, is thus defined.

Calyx of one leaf, (superior,) short, nearly entire. *Petals* definite, four, five, or six, broad at the base. *Stamens* equal in number to the petals, and opposite thereto, with distinct filaments, inserted into the disk, or receptacle of the flower. *Germen* simple; style one, or none; *stigma* simple. *Berry* of one or many cells, with one *seed*, or several, in a determinate number, whose surface is unequal, and which are inserted into the bottom of the cells. *Corculum* descending, its lobes straight, destitute of albumen. *Stem* shrubby, or rarely arboreous, trailing, knotty. *Leaves* alternate, with *stipulas*. The *tendrils*, or *flower-stalks*, are opposite to the leaves. These plants are akin to *Aquilicia* (*Leea*) and *Melia* in the broad base of their petals, sometimes in their leaves and inflorescence. On the other hand, some of the shrubby *Gerania* (*Pelargonia*) betray an affinity in habit to the *Vites*, and like them are occasionally acid in the taste of their herbage.

VITESSA, or VITTESSA, in *Mythology*, a name of the Hindoo Kuvera, regent of wealth. See KUVERA.

VITETZ, in *Geography*, a town of Bosnia; 14 miles S. of Serajo.

VITEX, in *Botany*, an old Latin name, of whose origin Linnæus professed ignorance, but which evidently comes from *vieo*, to bind, and alludes to the flexible nature of the twigs of the original species of this genus, the αγνος of the Greeks.—Linn. Gen. 326. Schreb. 427. Willd. Sp. Pl. v. 3. 390. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 66. Sm. Prodr. Fl. Græc. Sibth. v. 1. 441. Brown Prodr. Nov. Holl. v. 1. 511. Juss. 107. Tourn. t. 373. Lamarck Dict. v. 2. 611. Illustr. t. 541. Gærtn. t. 56. —Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*, Linn. *Vitices*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, cylindrical, short, with five broad shallow teeth. *Cor.* of one petal, ringent; tube cylindrical, slender, curved: limb flat, two-lipped; the upper lip in two segments; lower in three, the middle one largest. *Stam.* Filaments four, capillary, rather longer than the tube, two of them shorter than the rest; anthers versatile. *Pist.* Germen roundish, in the bottom of the calyx; style thread-shaped, the length of the stamens; stigmas two, awl-shaped, spreading. *Peric.* Drupa globose. *Seed.* Nut solitary, bony, of four cells, with a solitary kernel in each.

Eff. Ch. Calyx with five teeth. Limb of the corolla two-lipped; middle segment of the lower lip largest. Drupa with a nut of four cells.

Obs. Linnæus, and even Jussieu, misled perhaps by Tournefort's figure, describe the corolla as having six segments. We have never seen more than five in any species, though, if Tournefort be correct, six or seven may accidentally occur.—The species are shrubby or arborescent, with opposite, stalked, almost always digitate, *leaves*, without *stipulas*. *Flowers* aggregate, numerous, panicled, sometimes whorled, mostly blueish. Jussieu, with great reason, doubts the genus of *V. pinnata*, because of its alternate pinnate *leaves*.

1. V. *ovata*. Ovate-leaved Chaste-tree. Thunb. Jap. 257. Willd. n. 1. Ait. n. 1. (V. rotundifolia; Linn. Suppl. 294.)—Leaves simple, ovate.—Native of Japan, near the sea-shore. *Stem* shrubby, trailing, with quadrangular *branches*, downy when young. *Leaves* on short stalks, elliptical, or roundish, entire, with one rib, and several transverse veins; green and smooth above; white and finely downy beneath. *Panicle* terminal, oblong, silvery, with three-forked branches. *Calyx* hoary. *Corolla* purplish; downy and white on the outside. *Fruit* globular, the size of a pepper-corn, greenish, half covered by the permanent calyx.

2. V. *triflora*. Three-flowered Chaste-tree. Vahl Eclog. fasc. 2. 49.—Leaves ternate, entire, smooth on both sides. Stalks axillary and terminal, three-flowered.—Gathered by Von Rohr, in Cayenne. *Branches* purplish; downy and rusty when young. *Leaflets* elliptic-lanceolate, or obovate, quite entire, from two to five inches long; their common stalks an inch and half. *Calyx* near an inch in length. *Corolla* twice as much, clothed externally with tawny pubescence. *Vahl.*

3. V. *divaricata*. Spreading Chaste-tree. Swartz Ind. Occ. 1078. Willd. n. 3. Vahl Symb. v. 2. 76.—Leaves ternate, entire, smooth on both sides; the middle one very large. Panicle forked, divaricated.—Native of the West Indies. Gathered by Masson in St. Lucia; by Ryan in Martinico

Martinico and Santa Cruz. A *tree*, with square, smooth *branches*, ash-coloured when young, most leafy at the extremity. *Leaflets* ovato-lanceolate; the lateral ones an inch long; the odd one three or four times as much. *Flowers* whitish, five-cleft. *Drupa* half an inch long.

4. V. *pubescens*. Downy Chaste-tree. Vahl Symb. v. 3. 85. Willd. n. 4. (Pistacio-vitex; Linn. Zeylon. 195, according to Vahl, from the inspection of Hermann's Herbarium.)—Leaves ternate, downy. Panicles three-forked. Bracteas as long as the calyx.—Native of the East Indies. *Leaflets* near two inches long, ovate, thin, entire; nearly smooth above; ribbed, veiny, and downy, not hoary, beneath. *Panicles* large, terminal, their lowermost branches axillary. *Bracteas* oblong, obtuse, hoary. *Flowers* six or seven on the ultimate branches of the panicle, sessile, alternate, externally downy. *Fruit* the size of pepper.

5. V. *altissima*. Tall Ceylon Chaste-tree. Linn. Suppl. 294. Willd. n. 5. Ait. n. 2. (Mail-Elou; Rheede Hort. Malab. v. 5. 1. t. 1.)—Leaves ternate, pointed, nearly entire; downy beneath. Panicle with racemose whorled branches.—Found in the extensive forests of Ceylon by Koenig, who in his MSS. has indicated the indubitable synonym of Rheede, which the younger Linnæus neglected to quote, and which is likewise omitted in Hort. Kew. and Willdenow. Rheede speaks of this as a *tree* fifty feet high, found in many parts of Malabar, with a heavy reddish wood, fit for many uses. The *footstalks* are downy, sometimes winged, from one to three inches long. *Leaflets* elliptical, contracted at each end, from two to four inches in length; nearly smooth above; very downy and soft, not hoary, beneath; their margin usually entire; sometimes serrated. *Flowers* small, sweet-scented, blueish, numerous. The lower branches of the *panicle* are some of them four together. Each branch bears numerous, dense, partly stalked, many-flowered *whorls*, with downy lanceolate *bracteas*. Linnæus, after Koenig, describes but three *seeds* in each *drupa*, but Rheede says there are three or four.

6. V. *latifolia*. Broad-leaved Chaste-tree. Lamarck n. 5. (Katou-Mail Elou; Rheede Hort. Malab. v. 5. 3. t. 2.)—Leaves ternate, ovate, pointed, entire, minutely downy on both sides. Panicle much branched, forked, downy. Bracteas ovate.—Sent by Dr. Roxburgh from Calcutta. The *leaflets* are from two and a half to five inches long, and two or two and a half broad, finely veined; the younger ones soft to the touch. *Panicle* terminal, with large, opposite, stalked *bracteas*, downy on both sides. *Calyx*, and unexpanded *corolla*, very downy.

7. V. *Agnus-castus*. Common Chaste-tree. Linn. Sp. Pl. 890. Willd. n. 6. Ait. n. 3. Woodv. Med. Bot. t. 222. Sm. Fl. Græc. Sibth. t. 609, unpublished. (Vitex; Camer. Epit. 105. Matth. Valgr. v. 1. 177. Ger. Em. 1387. f. 1, 2.)—Leaves digitate, with five or seven lanceolate nearly entire leaflets; hoary beneath. Clusters panicled. Flowers whorled.—Native of low marshy places, about the banks of rivers, in Italy, Sicily and the Levant. Very common throughout Greece, in such situations, flowering in autumn. A low spreading *shrub*, with long, trailing, tough and pliant *branches*. *Leaflets* long and narrow, tapering at each end, with partial footstalks, usually quite entire, but sometimes broader and serrated, as in Gerarde's fig. 2. Their upper side is of a greyish-green, with a peculiarly fine velvet-like softness; the under white, and densely downy. *Common footstalks* downy, about half the length of the leaflets. *Clusters* terminal, long and cylindrical, divided into many dense whorls of numerous, light blue, or white, *flowers*. *Bracteas* lanceolate, solitary under each *flower*, the length of the *calyx*. The seeds have been celebrated for a marvellous power of promoting chastity. The scent of the recent plant is, to us, peculiarly unpleasant, causing a degree of nausea or faintness, which may perhaps account for its reputed virtues. The priestesses of Ceres are reported to have made their beds of the boughs of this tree, but whether this arose from the name in Greek being synonimous with chastity, or whether the name was given in allusion to the quality of the plant, no author has recorded, though Dioscorides seems to imply the latter.

8. V. *incisa*. Cut-leaved Chaste-tree. Lamarck n. 2. Willd. n. 7. Ait. n. 4. (V. Negundo; Curt. Mag. t. 364. V. Mill. Ic. 183. t. 175. f. 1, 2.)—Leaves digitate, with three or five pinnatifid leaflets; hoary beneath. Clusters panicled. Flowers whorled.—Native of China. Long known in our gardens, as a greenhouse shrub, by the name of *V. Negundo*. Lamarck, who speaks of this plant as nearly hardy in the open ground at Paris, first distinguished it as a species. It is smaller in every part than the preceding, and differs in having fewer, shorter, broader, deeply cut or pinnatifid *leaflets*. The *flowers* are purplish, with rounder segments; the lower one concave and somewhat heart-shaped.

9. V. *Negundo*. Indian Chaste-tree. Linn. Sp. Pl. ed. 1. 638. ed. 2. 890. Willd. n. 12. (Negundo arbor mas; Bauh. Hist. v. 2. 189. Bem-nosi; Rheede Hort. Malab. v. 2. 15. t. 12.)—Leaves digitate, with three or five elliptic-lanceolate, somewhat serrated, leaflets; hoary beneath. Clusters panicled. Flowers loosely whorled.—Native of the East Indies. This appears to be a *shrub* nearly related to the two last, but rather larger than either, with more decidedly quadrangular *branches*. The *leaflets*, more generally three than five, are broader than the last, yet not pinnatifid, but only bluntly, and rather sparingly, serrated. *Partial flower-stalks* more lax and corymbose. Yet this plant certainly differs from the serrated variety of *V. Agnus-castus*, having fewer, as well as broader, *leaflets*, and looser *whorls*. The *flowers* seem to be smaller than in that species. The synonym of Rumphius, cited by Linnæus, evidently belongs to *V. Leucoxylon*. Willdenow and Curtis copy without examination Linnæus's citation of Bauhin, which ought to be v. 2, not v. 1. The inflorescence in Bauhin's figure is very badly represented, nor are the leaves at all correct; yet there is enough to shew that it may be taken from our plant, though certainly nothing capable of giving a just idea of the species.

10. V. *trifolia*. White-leaved Panicled Chaste-tree. Linn. Sp. Pl. 890. Willd. n. 9. (Cara-nosi; Rheede Hort. Malab. v. 2. 13. t. 11. Lagondium vulgare; Rumph. Amboin. v. 4. 48. t. 18.)—Leaves ternate, sometimes quinate; leaflets ovate, acute, entire; hoary beneath. Cluster compound, with forked, elongated, zigzag branches.—Native of the East Indies. The perfectly entire *leaflets*, and their ovate or elliptical form, clearly mark this species, which is still more certainly distinguished by the long, spreading, doubly forked branches of its *cluster*, which assumes the aspect of a *panicle*, whose common stalk is straight. The *calyx* is angular. As to the other synonyms quoted by Linnæus, Plukenet's t. 206. f. 5. may be any thing; and Burm. Zeyl. t. 109. is a *Rhus*, with a prodigious confusion of synonyms not worth unravelling.

11. V. *Leucoxylon*. Green-leaved Corymbose Chaste-tree. Linn. Suppl. 293. Willd. n. 8. Ait. n. 5. (V. paniculata; Lamarck n. 3, excluding Plukenet's synonym. Lagondium littoreum; Rumph. Amboin. v. 4. 50. t. 19.)

 —Leaves

—Leaves ternate or quinate; leaflets elliptical, entire; slightly downy beneath. Panicles repeatedly forked, corymbose.—Native of the forests of Ceylon. *Koenig.* Sent to Kew, by Dr. Roxburgh, in 1793, through the hands of sir Joseph Banks. The *leaves* somewhat resemble those of *V. trifolia* in shape and size, but they are not at all hoary, though paler, at the back, with much longer partial stalks to the *leaflets*. The *panicles* are totally different, being cymose, or level-topped, downy, but not hoary. As to the "*berry*," as Koenig and Linnæus term it, "with a single *seed*," there is no reason to think it different from the rest of the genus.

12. V. *umbrosa*. Umbrageous Chaste-tree. Swartz Ind. Occ. 1076. Willd. n. 10.—Leaves quinate; leaflets elliptical, pointed, entire, nearly smooth on both sides. Clusters compound, axillary.—Native of mountainous situations in Jamaica. A large and spreading *tree*, with nearly cylindrical *branches*, leafy at the summit. Common *footstalks* two or three inches long, flattened, two-edged. *Leaflets* coriaceous, from three to five inches long and two broad, veiny; paler beneath, but not hoary; neither are they, as Dr. Swartz says, perfectly smooth; but rather roughish to the touch, from very minute hairs scattered over both their surfaces. *Clusters* from the bosoms of two or three of the uppermost leaves, and about the same length, rather downy, oblong, with simply forked branches. *Flowers* small. *Drupa* yellow, the size of a cherry, depressed at the summit.

13. V. *capitata*. Capitate Chaste-tree. Vahl Eclog. fasc. 2. 50. t. 18. Willd. n. 11.—Leaves quinate; leaflets lanceolate, entire, smooth. Flowers in capitate umbels, on axillary stalks.—Native of the island of Trinidad. *Ryan*. A *tree* of a moderate size, with roundish *branches*, somewhat angular when young. *Leaflets* four inches long, on partial stalks, the outer pair sessile, and smaller, as in the other species. *Flower-stalks* axillary, solitary, the length of the footstalks, smooth and slender, each bearing from six to twelve *flowers*, at first sessile, but subsequently elevated on short partial stalks, forming a kind of umbel. *Drupa* twice the size of a pea. *Vahl.*

14. V. *pinnata*. Pinnate Chaste-tree. Linn. Sp. Pl. 890. Willd. n. 13. Burm. Ind. 138. t. 43. f. 2.—Leaves pinnate, entire. Panicles triply forked.—Native of Ceylon. A very doubtful species. The Linnæan specimen is certainly only *V. trifolia*; but in sir Joseph Banks's herbarium is one supposed to be the true *pinnata*. Whether Vahl's *pubescens*, n. 4, be specifically distinct from this last, we are not informed.

14. V. *acuminata*. Pointed Chaste-tree. Brown n. 3.—Leaves ternate or quinate; leaflets ovate-oblong, pointed, smooth, entire. Cluster with forked branches. Calyx nearly without teeth. Stamens shorter than the corolla. Found by Mr. Brown, in the tropical part of New Holland.

15. V? *glabrata*. Smooth Chaste-tree. Brown n. 4.—Leaves ternate or quinate; leaflets ovate, smooth, entire. Flower-stalks axillary and terminal, forked. Calyx without teeth.—Gathered by Mr. Brown in the tropical part of New Holland, but the *flowers* were over. *Corolla* in sir Joseph Banks's plate four-cleft, above an inch long.

16. V? *macrophylla*. Great Simple-leaved Chaste-tree. Brown n. 5.—Leaves simple, ovate-oblong, entire, smooth, with transverse ribs; and two glands at the base. Stem arboreous.—Gathered in the tropical part of New Holland, by sir Joseph Banks, who sent a plate of this, and the preceding, to Linnæus. The *leaves* are six or eight inches long, and four broad. *Panicle* terminal, large, with zigzag, racemose, stout, many-flowered branches. *Calyx* somewhat two-lipped. *Corolla* five-cleft, an inch long, apparently white, with a dark purple lip.

Vitex, in *Gardening*, contains plants of the hardy and under-shrubby kinds; among which the species cultivated are, the officinal chaste-tree (V. agnus-castus); the cut-leaved chaste-tree (V. incisa); the three-leaved chaste-tree (V. trifolia); and the five-leaved chaste-tree (V. negundo.)

The first is a high shrubby plant of the late flowering kind, of which there are varieties with narrow leaves, with broad leaves, with blue flowers, and with white flowers.

The second sort is a low shrubby plant, with bright red flowers.

The third is of a shrubby growth, with violet flowers.

And the last has a small tree-like stem, with purplish flowers.

Method of Culture.—The first sort may be increased by cuttings and layers: the cuttings should be planted in the early spring, in a fresh light soil, being often refreshed with water till they have taken root; afterwards the plants must be kept clear from weeds, and be protected during the following winter with mulch or mats; and about the middle of the following March, when the season is fine, be removed into the places where they are to grow, or into the nursery for two or three years, to become strong; being pruned up to form regular stems.

The layers of the branches may be laid down in the spring, being careful not to split them, watering them in dry weather; when in about a year they may be taken off, and planted out in the same manner as the cuttings.

The second sort may likewise be increased by cuttings, which should be planted in pots, plunged in a moderate hot-bed, covering them with glasses: when well rooted, they may be taken up, and be planted in separate small pots, filled with light earth, putting them in the shade till fresh rooted; afterwards placing them in a sheltered situation, with other greenhouse plants, until the autumn, when they must have protection from frost, and have very little water. They are late in putting out leaves in the spring, so as almost to appear dead.

The third sort is raised from cuttings, which should be planted in pots in the early spring, as April, plunging them in a moderate hot-bed, covering them with hand-glasses, being slightly watered: when they have taken root, they should have free air admitted in a gradual manner; then they may be taken up, and planted out in separate pots filled with light earth, replunging them in the bed, and giving due shade. They should afterwards have plenty of free air, when the weather is suitable; being treated as tender plants. It must be constantly kept in the stove, having free air in the summer season. It retains its leaves all the year. This may also be raised from layers.

The fourth sort may also be raised from cuttings, in the same manner as the second.

The first two sorts may be introduced in the shrubberies, clumps, &c. succeeding well in any common soil and situation; and the latter kinds afford variety in stove and greenhouse collections, among other similar sorts.

VITI Chorea, in *Medicine*. See Chorea.

VITIA, in *Ancient Geography*, a country of Asia, in the vicinity of Armenia and of the Caspian sea. *Strabo*.—Also, a country of Asia, in the environs of Media, founded by the Æniaues of Thessaly, according to Strabo, and named Æneiana; which was also the name of the principal city.

VITICES,

VITICES, in *Botany*, one of Jussieu's natural orders, named from *Vitex*, which belongs to it. This order is the thirty-eighth in his system, the fifth of his eighth class, standing between the JASMINEÆ and LABIATÆ. (See those articles, under the last of which the character of this eighth class is indicated.) This same order is now, it seems, called *Verbenaceæ* by its author, in Ann. du Museum, v. 7. 63, which name is adopted in Brown's Prodr. Nov. Holl. v. 1. 510. The genera which compose it are chiefly found in the latter part of the PERSONATÆ of Linnæus. (See that article.) Mr. Brown's definition, as follows, is the latest and best, respecting this order.

Calyx tubular, permanent. *Corolla* inferior, of one petal, tubular, deciduous; the limb mostly irregular. *Stamens* generally four, two long and two short; rarely all of equal length; sometimes only two. *Germen* of two or four cells, the rudiments of seeds erect, solitary or in pairs. *Style* one, either cloven or undivided. *Pericarp* a drupa, or a berry. *Albumen* none, or very small. *Embryo* erect.

The plants of this order are trees or shrubs, rarely herbaceous. *Leaves* without stipulas, usually opposite; either simple or compound. *Flowers* either oppositely corymbose, or alternately spiked; sometimes crowded into a sort of head; rarely axillary and solitary.

Jussieu notes that the *stamens* are sometimes six, of which we find no instance, except casually in *Tectona*, whose stamens are properly five, all nearly equal. The *stigmas* are sometimes unequal. This author makes three sections.

Sect. 1. *Flowers oppositely corymbose.*

Clerodendrum, *Volkameria*, *Ægiphila*, *Vitex*, *Callicarpa*, all Linnæan genera; *Manabea* of Aublet, allied to *Ægiphila*; *Premna* of Linnæus; *Petitia* of Jacquin; *Cornutia*, *Gmelina*, *Tectona* (called *Theka* by Jussieu), and *Avicennia* of all authors. To these are to be added *Pityrodia* of Brown; and also his *Chloanthes*, notwithstanding its solitary flowers.

Sect. 2. *Flowers spiked; alternate.*

Petræa, *Citharexylum*, *Duranta*, *Lippia*, *Lantana*, of Linnæus; *Spielmannia* of Medicus and Jussieu; *Taligalea* of Aublet, which is *Amasonia* of Linnæus; *Tamonea* of Aublet, of which *Verbena lappulacea* is an example. See VERBENA n. 13; and *Perama* of Aublet, Schreber's *Mattuschkea*.

Sect. 3. *Genera akin to Vitices* (or *Verbenaceæ*).

Eranthemum, *Selago*, and *Hebenstretia* of Linnæus. The first of these Mr. Brown has indicated, in his Prodr. v. 1. 477, to be very confused in its history, the original type of the genus being next akin to *Justicia*, only having a nearly regular, and salver-shaped, *corolla*, with two of the *stamens* imperfect. What Jussieu intends under the name of *Eranthemum* are probably certain Cape species of *Selago*, with only two *stamens*, erroneously referred hither by Linnæus.

The order in question certainly forms a very natural link between the *Jasmineæ* and the *Labiatæ*, being most akin to the former in habit, scent of the flowers, and other qualities, as well as in the nature of the *pericarp*; while its *stamens*, *seeds*, and quadrangular *branches*, more obscurely connect it with the latter; to some genera of which, as *Ballota*, its often fœtid herbage, not to mention colour, pubescence, and inflorescence, betray an unexpected relationship.

VITIFERA, in *Ornithology*, a name by which many have called the common œnanthe, a bird well known in England by the name of the wheat-ear.

VITIGUDINO, in *Geography*, a town of Spain, in the province of Leon; 31 miles W.S.W. of Salamanca.

VITILIGO, a disease frequent among the Arabians: it is the same with what is otherwise called alphos.

VITILIGO, in *Botany*, so named from its leprous or scurfy appearance. See SPILOMA.

VITIMSKOI, in *Geography*, a town of Russia, in the government of Irkutsk, on the Lena. N. lat. 59° 5'. E. long. 112° 34'.

VITIS, or UTENS, in *Ancient Geography*, a river of Italy, in Cispadana, in the neighbourhood of Ravenna, between Sapis and Anemo.

VITIS, in *Botany*, usually derived from *vieo*, in allusion to the flexibility of its branches, is traced by De Theis to the Celtic *Gwid*, a tree, or shrub, as being the chief, or best, of trees. This would hardly satisfy us, were not *Gwin* the name of wine in the same language, from whence comes evidently enough, the Greek οἶνος, Latin *vinum*, Anglo-Saxon and French *vin*, English *wine*, &c.—Linn. Gen. 112. Schreb. 156. Willd. Sp. Pl. v. 1. 1180. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 51. Sm. Prodr. Fl. Græc. Sibth. v. 1. 161. Pursh 169. Juss. 267. Tourn. t. 384. Lamarck Illustr. t. 145. Dict. by Poiret, v. 8. 594. Gærtn. t. 106.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Hederaceæ*, or perhaps *Cucurbitaceæ*, Linn. *Vites*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, minute, five-toothed. *Cor.* Petals five, small, rude, cohering by their summits, deciduous before they fade. *Stam.* Filaments five, awl-shaped, spreading, a little ascending, deciduous; anthers simple, incumbent. *Pist.* Germen superior, ovate; style very short; stigma capitate, obtuse. *Peric.* Berry large, roundish, of one cell. *Seeds* five, erect, obovate, bony, contracted at the base, deeply furrowed on one side.

Ess. Ch. Petals cohering at the summit, unfading. Berry superior, with five erect obovate seeds.

Obs. The seeds are naturally five, though two or three are generally abortive in our northern climes, which has puzzled some writers. They are described by Linnæus as half bilocular, because the lateral furrows are so deep, as to encroach half way on the cavity of their shelly covering. The North American species are said to be all dioecious, which however is not the case with *V. quinquefolia*, nor *V. arborea*, both improperly removed to *Cissus* by Persoon and Pursh, and referred by Michaux to his new genus *Ampelopsis*, whose characters are not sufficient to separate it from *Cissus* or *Vitis*. *Cissus* is properly distinguished from *Vitis*, not so much by having four-cleft tetrandrous *flowers*, which circumstance is variable or inconstant, but by the reflexed *petals*, and the presence of a cup-like *nectary*, surrounding the *germen*.

1. V. *vinifera*. Common Vine. Linn. Sp. Pl. 293. Willd. n. 1. Ait. n. 1. Schmidel Ic. 32. t. 7. Jacq. Ic. Rar. t. 50. Sm. Fl. Græc. Sibth. t. 242, unpublished. Inf. of Georgia, v. 1. 87. t. 44? Matth. Valgr. v. 2. 655. Camer. Epit. 1003. Ger. Em. 875.—Leaves heart-shaped, five-lobed, sinuated, naked.—Found, naturalized at least, in most parts of the more temperate climates of the globe; yet it is not supposed to be a native of America. Mr. Hawkins judged it to be truly wild on the banks of rivers in Greece. The cultivated Vine, sporting in endless varieties of the shape, colour, and flavour of its fruit, and differing much with respect to hardiness of constitution, is well known as an important and interesting object of horticulture. (See VINE and WINE.) Our business here is with the same plant in its native state, as found in Greece, flowering in May or June. The *stem* is woody, tough, sending out long, trailing, subdivided, furrowed, leafy *branches*, which climb by means of tendrils to a great extent, and when young are clothed with loose shaggy down. *Leaves* alternate,

nate, on longish stalks, simple, roundish-heartshaped, notched, coarsely serrated, veiny, divided about half way into five, more or less distinct, lobes; when young they are downy like the branches, especially beneath; but otherwise naked and smooth; deciduous. *Tendrils* opposite to each footstalk, solitary, spiral, divided, about the length of the leaves. *Clusters* here and there in the place of a tendril, drooping, panicled, much branched, the ultimate stalks somewhat umbellate, or corymbose. Flowers very numerous, small, green, fragrant like Mignonette. *Petals* forced from their base by the stamens, which elevate them in the form of an umbrella, downy at the top. *Berry* small, black. Every part of the plant is acid, with some astringency.—One variety only is particularly noticed by Linnæus, the *V. corinthiaca, sive apyrena*, Bauh. Hist. v. 2. 72, of which a specimen from Madeira is preserved in the Linnæan herbarium. The *fruit* is said to be very small, without *seeds*. The late Dr. Sibthorp brought a living plant, supposed to be of this kind, from the ruins of Corinth, with no small trouble and care; but his ignorant gardener threw it away. Whether the Zante Currant be precisely the same is doubtful. This is cultivated at Kew, and in some other curious gardens.

2. V. *palmata*. Palmate Vine. Vahl Symb. v. 3. 42. Willd. n. 2. Pursh n. 6.—"Leaves palmate, smooth; their segments deeply serrated. Umbels racemose."—Said to be a native of Virginia, but Mr. Pursh met with nothing in North America answering to this description. Vahl had his specimen from the Paris garden. The *branches* are purplish, smooth. *Leaves* as broad as long, smooth; heart-shaped at the base; their segments lanceolate, tapering; the lateral ones having lanceolate teeth at their outer margins; the central one deeply serrated at each side. *Stipulas* lanceolate. *Clusters* an inch long, composed of small crowded *umbels*. *Vahl.* We presume this to be a mere variety of *V. vinifera*, as well as the two following, which therefore we here place near it.

3. V. *laciniosa*. Parsley Vine. Linn. Sp. Pl. 293. Willd. n. 8. Ait. n. 5. (V. folio apii; Bauh. Hist. v. 2. 73.)

β. V. laciniatis foliis; Cornut. Canad. 182. t. 183. Schmidel. Ic. 34. t. 8.

Leaves of five many-cleft leaflets, or deep pinnatifid lobes.—Long known in gardens, but no botanist has discovered its native country. The *leaves* are quite smooth. We know no difference between this and *V. vinifera*, except, which indeed is very remarkable, the *leaves* being either composed of five deeply cut, partial-stalked *leaflets*, as in the Linnæan original specimen, and Bauhin's figure; or only very deeply five-lobed and jagged, like the plates of Cornuti and Schmidel. We readily allow them to constitute one and the same species with the Common Vine, and probably the following.

4. V. *pinnata*. Pinnate Vine. Vahl Symb. v. 3. 43. Willd. n. 11.—"Leaves pinnate, smooth, with tooth-like serratures."—Given to professor Vahl by Mr. Schumacher. Its native country is unknown. The *branches* are purplish, smooth and round. *Leaflets* five; the middle ones nearly sessile; the rest stalked; the two lowermost often furnished with an accessory lobe at the outer margin, ovate, pointed, with three or four large serratures at each side; pale green beneath, two inches long. *Flower-stalks* opposite to the leaves, twice compound; partial ones umbellate. *Flowers* small. This seems an intermediate variety between the α and β of *V. laciniosa*, probably obtained from some garden.

5. V. *indica*. Indian Vine. Linn. Sp. Pl. 293. Willd. n. 3. Ait. n. 2. Swartz Obs. 95. (V. fructu minore rubro acerbo, folio subrotundo, minùs laciniato, subtùs albâ lanugine tecto; Sloane Jam. v. 2. 104. t. 210. f. 4. Schembra-valli; Rheede Hort. Malab. v. 7. 11. t. 6.)—Leaves heart-shaped, toothed; downy beneath. Tendrils bearing the clusters.—Native of the East and West Indies. Swartz says the twigs, when cut, distil a cool refreshing watery juice, highly grateful to the natives of the torrid zone. The *leaves* are sharply toothed, not lobed; very white at the back, according to Sloane; but this is wanting in the Linnæan East Indian specimen, which we suspect rather to belong to *Cissus*. This however is not an original specimen. The *fruit* is red, or deep purple, the size of currants, and agreeably acid as well as astringent. *Sloane.*

6. V. *flexuosa*. Zigzag Japan Vine. Thunb. Tr. of Linn. Soc. v. 2. 332. Willd. n. 4. (V. indica; Thunb. Jap. 103.)—Leaves heart-shaped, toothed; villous beneath. Stem zigzag. Panicles elongated.—Native of Japan, where it is called *Itadori*. The *leaves* are chiefly villous at the ribs underneath. *Footstalks* slender, as long as the nail. *Panicles* unattended by *tendrils*. *Thunb.*

7. V. *Labrusca*. Downy-leaved Vine, or Fox-grape. Linn. Sp. Pl. 293. Willd. n. 5. Ait. n. 3. Pursh n. 1. "Jacq. Hort. Schoenbr. t. 426." Sm. Inf. of Georgia, v. 1. 55. t. 28.)—Leaves broadly-heartshaped, angular or slightly lobed, toothed; white and cottony beneath. Berries few, somewhat depressed.—Native of shady woods, from Canada to Florida, flowering in June and July. *Berries* black, large, of a disagreeable foxy smell, whence they are commonly called Fox-grapes. A variety with white *berries* is called Bland's Grape. *Pursh.* The *leaves* appear to be sometimes but slightly toothed. Each bunch consists of about six grapes, three-fourths of an inch in diameter, red before they are ripe. We have not seen the fourth volume of Jacquin's Hortus Schoenbrunensis, and are therefore obliged to take our references from Pursh, under this and a few other species.

8. V. *æstivalis*. Summer Grape. Michaux Boreal.-Amer. v. 2. 230. Pursh n. 2. "Jacq. Hort. Schoenbr. t. 425," according to Mr. Pursh. (V. Labrusca; Walt. Carol. 242.)—Leaves broadly-heartshaped, with three or five lobes, finely toothed; downy and rusty when young. Clusters of fruit oblong.—In fields and woods, from Virginia to Carolina, flowering in May and June. *Berries* small, dark blue, very agreeable to eat, and frequently converted into very good home-made wine. It is known by the name of Summer Grape. *Pursh.* This author mentions, by the name of *sinuata*, a variety which he thinks may be a distinct species, and which is thus defined. "Leaves sinuato-palmate, coarsely toothed; each sinus rhomboid." Can this be the plant figured in Sm. Inf. of Georgia, t. 44. as *V. vinifera?* (See the first species.) We have from the late Rev. Dr. Muhlenberg a specimen answering exactly to the above specific character of Michaux and Pursh, but without any information annexed. Whether it be *labruscoides*, Muhlenb. Cat. 27, as we should guess by that name, or *intermedia* of that work, as indicated by the synonym, there is no possibility of knowing. The *leaves* in our specimen are glaucous beneath, and clothed with loose, partly rusty, cobweb pubescence, not with dense white cottony down like *V. Labrusca*. The veins terminate in small, acute, marginal teeth. *Clusters* downy and rusty, as well as the *footstalks*.

9. V. *vulpina*. Winter Grape, or Chicken Grape. Linn. Sp. Pl. 293. Willd. n. 6. Ait. n. 4. (V. cordifolia; Michaux Boreal.-Amer. v. 2. 231. Pursh n. 3. "V. incisa; Jacq. Hort. Schoenbr. t. 427.")—Leaves heart-shaped, pointed, sharply serrated, smooth on both sides,

fides, with axillary glandular tufts to the veins beneath. Clufters lax, nearly fmooth.—On the margins of rivers, and in woods, from Canada to Florida, flowering in June and July. *Berries* green or amber-coloured, fmall, ripening extremely late, of a very tart tafte. *Purfh.* This is certainly the *vulpina* of Linnæus, and confequently of Willdenow, though Purfh cites the latter author under the foregoing fpecies. The *leaves* of the prefent have but a flight indication of a lobe at each fide, and are more oblong and pointed than either of the two laft; being moreover quite fmooth, from the earlieft period, except the little axillary tufts of hair on the under fide. The *footftalks* and *branches* are fmooth.

10. V. *riparia.* Sweet-fcented Vine. Michaux Boreal.-Amer. v. 2. 231. Purfh n. 4. (V. odoratiffima; Donn Cant. ed. 5. 53.)—"Leaves unequally and deeply toothed, flightly three-lobed; their margins, ribs, and footftalks, downy."—On the gravelly fhores and iflands of the rivers, from Pennfylvania to Carolina, flowering from May to July. Female plants are very feldom found north of the Potowmac river, though the male extend very far beyond it. The *flowers* have an exquifitely fine fmell, fomewhat refembling *Refeda odorata. Purfh.* We have feen the male plant in bloffom in fome gardens, though not noticed by Mr. Aiton. The fcent is not fuperior to that of the common *V. vinifera,* which likewife exactly refembles Mignonette.

11. V. *rotundifolia.* Bull or Bullet Grape; fometimes called Mufcadine Grape. Michaux Boreal.-Amer. v. 2. 231. Purfh n. 5. (V. vulpina; Sm. Inf. of Georg. v. 1. 81. t. 41.)—"Leaves kidney-heartfhaped, fmooth and fhining, nearly equally toothed. Flowers in numerous little heads."—On river fides, and iflands, from Virginia to Florida, flowering in June and July. *Berries* very large, dark blue, agreeable, commonly called Bull or Bullet-grapes. *Purfh.* We have feen no fpecimen. Mr. Abbot, in his drawing for the Infects of Georgia, reprefents the *fruit* full three-quarters of an inch in diameter, dark purple, dotted, few in each clufter. *Leaves* fmaller, fhorter, more ftrongly toothed than in the laft; apparently quite fmooth.

12. V. *heterophylla.* Various-leaved Vine. Thunb. Jap. 103. Willd. n. 7.—"Leaves fimple, naked, with three or five deep ferrated lobes."—Found near Nagafaki, and on Papenberg, in Japan, flowering in July and Auguft. It is there called *Inu Ganebu,* or Wild Vine. The *ftem* is climbing, fmooth, branched and knotty. Loweft *leaves* five-lobed; uppermoft undivided; all pale beneath, with rough veins. *Panicles* forked. By the defcription of an annular *nectary,* this feems to be a *Ciffus.*

13. V. *hederacea.* Five-leaved Vine, or Virginian Creeper. Ehrh. Beitr. v. 6. 85. Willd. n. 9. Ait. n. 6. (V. quinquefolia; Sm. Inf. of Georg. v. 1. 59. t. 30, reverfed. Hedera quinquefolia; Linn. Sp. Pl. 292. Edera quinquefolia canadenfis; Cornut. Canad. 99. t. 100. Ampelopfis quinquefolia; Michaux Boreal.-Amer. v. 1. 160. Ciffus hederacea; Purfh 170.)—Leaflets five, ovate, pointed, ferrated, fmooth. Clufters zigzag, corymbofe.—On the Allegany mountains; from Pennfylvania to Virginia, flowering in June and July. Well known in England, where it has long been cultivated, as an ornamental climber, for covering lofty buildings. It flourifhes even in the clofe courts, and peftiferous cemeteries, of the city of London. In autumn, the leaves, before they fall, affume fplendid tints of red and orange. The *tendrils* attach themfelves to the furface of the fmootheft flint. The *leaves* are bright green, fmooth and fhining, of five ftalked *leaflets,* about two inches long. Common *footftalks* three inches in length. *Panicles* lateral and terminal, many-flowered, divaricated, fmooth. *Flowers* umbellate, green, deftitute of a *nectary;* their *petals* concave, cohering at the fummit, and feparating from the bafe, exactly as in a true *Vitis,* fo that we cannot but wonder at the confufion of recent authors refpecting the genus of this plant, even more than at Linnæus for referring it to *Hedera.* The *berries* are blueifh-black, lefs than a common pea. Purfh mentions a variety named *hirfuta,* whofe *leaves* are downy on both fides, which he thinks may be fpecifically diftinct. But he had never feen the *flowers,* nor are we further informed on the fubject.

14. V. *arborea.* Pepper Vine. Linn. Sp. Pl. 294. Willd. n. 12. Ait. n. 7. ("V. caroliniana, foliis apii, uvâ corymbofâ purpurafcente; Comment. Bonon. v. 2. part 2. 365. t. 3." Ampelopfis bipinnata; Michaux Boreal.-Amer. v. 1. 160. Ciffus ftans; Purfh n. 3. Frutex fcandens, petrofelini foliis, virginianus; Pluk. Mant. 85. t. 412. f. 2.)—Leaves twice or thrice compound; leaflets ovate, partly wedge-fhaped, cut.—In fhady woods, by river fides, in Virginia and Carolina, flowering in June and July. *Stem* upright. *Purfh.* The *leaflets* are about an inch long, more or lefs acute, ftalked, fomewhat hairy, efpecially the veins, which are furnifhed with axillary glands beneath. *Tendrils* branched. *Clufters* lateral, corymbofe, fomewhat forked. Plukenet fays this was firft raifed from feed in England, by Mr. Samuel Reynardfon, an eminent merchant of London, at his villa at Hillingdon, before the year 1700. His houfe and garden ftill remain, and we have there often admired the largeft Cedar of Lebanon in England, blown down about the year 1794.

V. heptaphylla, Linn. Mant. 212, proves by the fpecimen to be very nearly, if not quite, the fame as *Aralia Sciodaphyllum,* Willd. Sp. Pl. v. 1. 1519, nor is there any appearance of its being an Eaft Indian plant.

The late Mr. Donn has a *V. lucida,* Hort. Cant. ed. 5. 53, a New Holland fhrub, introduced in 1790, of which we find no other mention.

Vitis, in *Gardening,* contains plants of the deciduous climbing kind; among which the fpecies cultivated are, the common vine, or grape vine (V. vinifera); the Indian vine (V. indica); the parfley-leaved vine (V. laciniofa); and the tree or pepper vine (V. arborea).

The firft fort has a weak brown-coloured ftem, and is a native of moft of the temperate parts of the world. In very cold regions it refufes to grow; and within 25° or even 30° of the equinoctial line, it feldom flourifhes fo as to produce good fruit. In the northern hemifphere, the proper wine country is from 25° to 51° of latitude; and, according to Forfyth, the following are the varieties which are in moft efteem in this climate for the hot-houfe, vinery, and the natural wall.

Sorts proper for the Hot-houfe.

The white mufcat of Alexandria, or Alexandrian Frontinac, in which the berries are oval, and the bunches long. It has a rich vinous juice, and is efteemed an exceeding good grape for the hot-houfe.

The red mufcat of Alexandria, which refembles the former, only the berries are of a red colour.

The black mufcadel, which has large oval berries of a black colour and pleafant juice.

The red mufcadel, which has large red berries of an oval fhape, and ripens late. The bunches are very large.

The black Damafcus, which has large, round, black-coloured berries; the flefh is rich and well-flavoured. It is an excellent late grape.

The black grape from Tripoli, which has large black berries, and is an excellent grape.

The

The white Hamburgh, which has large oval-ſhaped berries, and is a pretty good bearer.

The red grape from Syracuſe, which is a very fine large grape.

Le cœur grape, or Morocco grape, which has berries of a tawny colour, and is highly eſteemed.

The golden Galician grape, which has large oval berries of a yellow colour, and tolerable flavour.

The black raiſin grape, which has large black berries of an oval form; the ſkin is thick, and the fleſh firm.

The white raiſin grape, which reſembles the preceding, only that the berries are white.

The Malvoiſe, ſometimes called the blue Tokay, which has ſmall browniſh berries, powdered with a blue bloom; the juice is vinous.

The Syrian grape, which has large, white, oval berries, with a thick ſkin and hard fleſh, and is a good bearer.

The damſon grape, which has very large berries of a purple colour.

The Cornichon grape, which has berries of a remarkable ſhape, long and narrow, of a white colour, with a firm ſweet fleſh.

The red chaſſelas, which is very like the chaſſelas blanc in ſize and ſhape, but is of a dark-red colour. It is a very good grape, but ripens later than the white.

Sorts proper for the Vinery.

The red Frontinac, or muſcat rouge, which is a very fine grape, and greatly eſteemed. It has large brick-coloured berries, and the juice is of a highly vinous flavour.

The large black cluſter, which is larger than the former, and has a very rough harſh taſte. Mr. Speechley ſays, that he had this grape from Liſbon, and was aſſured that it is the grape of which they make red Port wine. He has had the ſame grape eight or ten years.

The white grape from Alcobaca, which bears large bunches of white juicy berries.

The white parſley-leaved grape, or ciotat, which has round berries, white, juicy, and ſweet. There is a ſort of the parſley-leaved grape with red fruit.

The white Corinth grape, which has a ſmall round berry, with a fine juicy fleſh of an agreeable flavour.

The St. Peter's grape, which has a large oval berry, of a deep black colour when ripe; the bunches are large, and the fleſh juicy. It ripens late.

Sort proper for the Wall.

The white or common muſcadine, by ſome called the chaſſelas, which reſembles the royal muſcadine, but the berries are ſmaller; and although it is not ſo ſweet as the royal, it is the beſt grape that we have for a common wall, and a great bearer.

Sorts proper for the Hot-houſe and Vinery.

The black muſcadine, which is a good bearer, and the berries are beautifully powdered with a blueiſh bloom.

The royal muſcadine, d'Arboyce, or chaſſelas blanc, which is an excellent grape; the bunches are large, and compoſed of round amber-coloured berries of a rich vinous taſte. In a fine ſeaſon it ripens in September.

The white muſcat from Lunel, which has large oval berries of an amber-colour, and full of a vinous juice. It is a plentiful bearer, and highly eſteemed.

The black Spaniſh, or Alicant grape, which has black berries of a pleaſant flavour.

The black grape from Liſbon, which has large, round, juicy berries, and the bunches reſemble the black Hamburgh. It is a good grape.

The black Frontinac, or muſcat noir, which has pretty large round berries, black when ripe, and covered with a mealy powder.

The griſly Frontinac, which has round berries, of a colour compoſed of brown, red, and yellow. It has an excellent flavour.

The black Hamburgh, which has the bunches large, compoſed of large oval black berries, of a pleaſant ſweet juice and vinous flavour. It ripens in November.

The red Hamburgh, which has thin-ſkinned berries of a dark red. They have a rich vinous flavour, and ripen about the ſame time with the former.

The white morillon, which has an oval-ſhaped juicy berry, and the leaves are downy on the under ſide.

The Aleppo grape, which has middle-ſized berries, with a juicy fleſh of a very fine flavour. It is a curious grape, frequently ſtriped black and white.

The genuine Tokay, which is a white grape, with a thin ſkin, delicate fleſh, and agreeable juice.

The Lombardy grape, which has fine, large, flame-coloured berries, full of a fine juice; and the bunches grow to a great ſize, frequently weighing more than ſix pounds.

The Smyrna grape, which has a large red berry, of a very fine flavour, and is eſteemed a very good grape.

The brick grape, ſo called from its colour, has ſmall berries, but the juice is ſweet.

The claret grape, which has ſmall black berries, with a blood-red juice; but the grape is very harſh, if not perfectly ripe.

The cat's grape, which has ſmall berries of a pale-green colour; the fleſh is ſoft and juicy, but of a very diſagreeable taſte, unleſs quite ripe.

The Greek grape, in which the berries are of a blueiſh-white colour; and it is eſteemed a fine grape.

The black Corinth, or currant grape, which has a ſmall roundiſh berry, generally without a ſtone, of a deep black colour. It has a ſweet juice, and ripens in October.

The new muſcat of Jeruſalem, which has large round berries of a red colour; ſome of which, in fine ſeaſons, are as large as a gooſeberry; but as it does not ripen well on the natural wall in this country, it might be worth while to try it in a hot-houſe or vinery.

The black Prince, which has fine large berries, and the bunches grow to a large ſize. Mr. Forſyth has had them, in a favourable ſeaſon, on the natural wall, weighing a pound and a half: it ripens on the natural wall in October. It deſerves a place in the hot-houſe and vinery.

Sorts proper for the Vinery and Wall.

The July grape, or morillon noir hatif, is a ſmall round black berry of a ſugary juice, and is principally eſteemed for being early ripe, which is in September.

The Malmſey muſcadine ſomewhat reſembles the preceding; the juice is very ſweet, and of a high flavour. This is a good bearer, and a very fine grape.

The black ſweet-water has a ſmall roundiſh berry, of a ſweet taſte; but being apt to crack, is not in much repute. The birds are very fond of this grape, which ripens in September.

The ſmall black cluſter has ſmall oval berries; the leaves are covered with a hoary down. This is a very pleaſant fruit.

The early white grape from Teneriffe; the berries are of a middling ſize, and the fleſh remarkably ſweet and juicy.

The Auverna, or true Burgundy grape, ſometimes called the

the black morillon, is an indifferent fruit for the table, but is efteemed one of the beft for making of wine.

Sorts proper for the Hot-houfe, Vinery, and Wall.

The white fweet-water, which has a large berry of a white colour, and very agreeable juice; it is efteemed an excellent grape, and ripens in September.

The white Frontinac, or mufcat blanc, which has large bunches compofed of round berries: the juice of this grape, when fully ripe, is exquifite.

To this lift are added the following forts, without any defcriptions.

The black Frankindale, the black Gibraltar, the black mufcat of Alexandria, the Miller grape, the new white fweet-water, the paffe mufk, the pearl mufcadine, the red Conftantia, the red raifin, the fir Abraham Pitcher's fine black, the Weft's St. Peter, the white Conftantia.

And the following are the forts recommended for a fmall garden, by the fame author.

The white mufcadine, white fweet-water, black fweet-water, large black clufter, fmall black clufter, the Miller grape: the St. Peter's and the black Hamburgh anfwer well in favourable feafons.

The writer of the Scotch Forcing Gardener remarks, that amongft the numerous varieties of grapes, he does not know above eighteen or twenty kinds worth a place in the vinery, and even that number cannot have places in an ordinary-fized houfe; but where there are two or three houfes, a variety to the extent of twenty-four kinds may be encouraged, without tranfgreffing the bounds of moderation. The following is the lift which he advifes.

White fweet-water, white mufcadine, royal ditto, black ditto, black Frontinac, white ditto, red ditto, Grifly ditto, black Hamburgh, white ditto, white raifin, red ditto, Syrian, white Tokay, flame-coloured ditto, white paffe mofque, Grecian, white mufcat of Alexandria, black ditto, large black clufter, black Conftantia, white ditto, St. Peter's grape, Lombardy.

Out of which, it is thought, the proprietors of grape-houfes may choofe fo as to ftock any grape-houfe.

To the above forts may probably be added the verdelho, which is pronounced *verdelio*, as it is faid to be the moft prevailing grape in the vineyards, and the moft famous for producing the beft wine of the Madeira kind; though the celebrated white wine obtained from that ifland is moftly underftood to be the production of a mixture of different grapes.

Cuttings of this vine, procured from the above place, are faid not only to grow remarkably well and with great vigour in the vinery here, but to be greatly productive of fruit, frequently giving three bunches on a fhoot. As it does not, however, form a large bunch, it will probably not be thought worthy of culture here, except by thofe who are curious in the flavour of their grapes. The berry is fmall, of an oval fhape, and many very fmall berries without feeds are ufually interfperfed: thefe being cut out with fciffors, will, it is afferted, much improve the appearance of the bunch. The fruit is faid to be very acid until it arrives at the laft ftage of maturity, when the berries become of a fine amber colour, and of a very rich faccharine flavour. It is fuppofed that this vine will fucceed in favourable fituations on the open wall, efpecially where the foil is light, dry, and fhallow; but that in a deep highly manured foil, it will run too much into wood and foliage.

The leaf is very thick, of a dark green colour, and refifts the autumnal frofts fomewhat longer than the chaffelas, and fome other kinds; and will therefore, it is fuppofed, in the ordinary courfe of the feafons here, afford protection to the fruit till towards the end of the month of October.

The fecond fpecies or fort has a woody branching ftem, affording fmall round watery berries of a brownifh-green appearance. But it is faid to produce a great quantity of black grapes in the lower hills of Jamaica, which are of a rough tafte, and would doubtlefs make an excellent wine, if properly managed. It feems to thrive beft on the Red-hills, and is there known by the name of water-withe.

The third fpecies or fort has the ftalks and branches like thofe of the common grape, but has only a few plants, occafionally preferved for the fake of variety.

The laft fpecies or fort has the ftem woody with flender branches, but does not afford fruit in this climate.

Method of Culture.—The vine may be increafed in different ways: as by feeds, cuttings, layers, as well as by grafting and inoculation; but the cutting and layer methods are the moft commonly employed.

In raifing vines from feeds, they fhould be fown in the early fpring, as about the beginning of March, in fmall pots filled with mould of the light frefh kind, to the number of three or four feeds in each, plunging the pots in a moderate hot-bed, the mould being gently fprinkled over with water, from a fine-rofed watering-pot, every day when the weather is hot and dry, which fhould be performed in the latter part of the day as the fun difappears from the frame. But when the feafon is fuch as to keep the mould in the pots properly moift, the waterings may be omitted. As foon as the waterings have been performed, the frames fhould be fhut down, and be kept in that ftate during the night, when the heat is not too great.

When the heat of the bed begins to decline, a lining of horfe-dung and frefh leaves fhould be added; or the heat be renewed by ftirring the old beds up and making flight additions to them. This fhould be continued till the plants have acquired fufficient ftrength to fupport themfelves without bottom heat.

It will be neceffary about the end of Auguft, Mr. Forfyth fuggefts, to take the lights off, that the plants may be hardened before winter, taking care to fhelter them in frames covered with mats, which will prevent the froft in the latter end of October and beginning of November from injuring the tender fhoots. And when the plants are about fix inches high, they fhould, it is thought, be tranfplanted fingly into deep pots, forty-eights, filled with the fame fort of vegetable mould that is directed to be ufed for vines; taking great care not to hurt the roots, nor to break the leaders; then plunging them again into the hot-beds: but if the heat of the old bed be too much decayed, it will be neceffary to have a new one prepared before-hand, to receive the pots as foon as the plants are tranfplanted. When they grow vigoroufly, it will alfo be neceffary to fhift them into thirty-twos. When the plants are above fix inches high, they fhould be carefully tied to fmall rods, leaving only one ftem for the firft year. The rods fhould be as high as the frame will permit. And when the leaves begin to drop, they fhould be carefully picked off the pots, to prevent the plants from getting mouldy, which would very much injure their growth.

It is likewife advifed, that they fhould be kept under frames, or put into the greenhoufe in hard winters, to fhelter them from fevere frofts. In the fpring, about March or the beginning of April, if from feed ripened in this country, they may be planted out againft the walls where they are to remain; but if from feed imported from vine countries, it is advifed not to plant above one or two againft the wall, or in the hot-houfe, before a fpecimen of the fruit has been obtained,

tained, and proof afforded that the vines are worth cultivation. It is likewise recommended, that after they are planted, they should be cut at the third eye, if strong; but at the second, if weakly; at the same time rubbing off the lower bud with the finger and thumb, as directed below.

But where the method by cuttings is made use of, these should be chosen from the shoots that are best ripened, and have the shortest joints; always having one or two joints of the last year's wood, cutting it perfectly smooth and a little rounding at the lower end, and as near to a joint of the old wood as possible. The upper end should also be cut smooth and sloping towards the wall; but if they are planted in beds or borders, the cut should always face towards the north. When cuttings are planted against piers or walls, it should be at about a foot distance from each other, according to the vacant space, and so deep as to have the second eye level with the ground, constantly rubbing off the lower eye; as by this means, where no accident happens to the top bud, there will be a shoot produced from each eye, with a little one under, which should always be rubbed off as soon as it begins to swell; as if suffered to grow to any considerable size, there will be danger of injuring the large one in rubbing the small one off. All the runners and side-shoots should likewise be picked off as directed above, leaving only two shoots, which should be trained at their full length. About the beginning of February they may be pruned, leaving one or two eyes on each, according to the strength of the shoot, which should be managed as explained below.

It is remarked by the above writer, that for the first year, especially if the summer be dry, and proper attention be not paid to the watering of them, they will make but little progress; but in the second year it may be plainly discerned which is the strongest plant, which only should be left to fill up the vacant space on the wall; the rest should be taken up and planted in other situations where they are wanted for fruit.

However, a method is made use of by Mr. Speechley and others, of propagating the vine from one eye, and a few inches of the preceding year's wood, which they prefer to those raised by cuttings in the common way, on these accounts: they have more abundant roots, grow shorter jointed, are more prolific, and will, if permitted, come into bearing the second year.

In regard to the mode of management, it is advised that choice should be made of cuttings after a warm dry season, when the wood ripens well; each cutting having two inches of the old wood, with one eye of the new. When the vines are pruned there is great choice; they should therefore be then selected of a middling size, the wood round and perfectly ripened.

After this, pots are to be filled with rich light mould, that has been well meliorated and prepared some time before. The cuttings being then prepared for planting, by the bottom part being cut perfectly smooth; if any of the old dead snags remain, they should be cut off close to the quick wood, and the top cut sloping towards the back of the hot-house or frame, when placed in them. Mr. Forsyth recommends planting only one cutting in each pot, which as to the size should be a deep forty-eight; by that means he thinks the plants will grow much stronger and quicker than when many are crowded together, and the sun and air will have a freer admission to ripen the wood; for, when many are planted in one pot, they shade one another, and in a considerable degree prevent the sun and air from passing freely among them. When the plants begin to get strong, and the pots full of roots, it will be necessary to shift them from the forty-eights to thirty-twos. This method is, he contends, best adapted for private gardens; but for nurserymen, &c. who raise plants for sale, and cannot conveniently spare so much room, it may be necessary to plant three or more cuttings in each pot.

And in these cases, the same rules for watering, transplanting, shifting, &c. are to be attended to as was directed for the seedling plants.

The same writer remarks, that it is a method very frequently practised by nurserymen and gardeners, when they wish to have their plants fit for sale the same year, to plant them in pots, and place them in the hot-house among the tan, on the flues, or round the curbs of the pit. And he has seen it employed with great success. In this way they may, it is asserted, be raised either by planting them singly in small pots, or several in a pot, according to its size, planting them out separately when they have taken root, having a hot-bed ready to plunge the pots in as soon as they are transplanted. In this manner they become much forwarded in their growth, and are before the autumn in a state fit for sale.

In raising vines in the layer manner, the method usually made use of is by stools, in the open quarters of the garden, in the same manner as nurserymen propagate forest-trees and shrubs: but the best way, according to Forsyth, is to take layers from these on walls or palings, training the shoots at full length during the summer; when about the month of February some of the finest and strongest shoots should be chosen, laying them across the foot-path into pots (twenty-fours or sixteens) filled with fresh mould, and plunging them in the ground about two inches below the surface; at the same time making an incision or two in the old wood, or giving it a twist just below a joint; and though they will generally take without notching or twisting, it is nevertheless advised, as the surest way, to have that done. The layers should then be cut, leaving two or three strong eyes upon each. And when the shoots begin to run, they should be tied to long stakes, to prevent their being broken by the wind; all the runners and side-shoots being picked off, leaving only two or three fine strong shoots on each plant, which should be trained at full length during the summer season.

As soon as the shoots are laid down, it will be necessary to mulch them with good rotten dung, or rotten leaves, which will keep the mould moist: and in very dry summers, a good watering should be given once or twice a week: this will wash in the dung or leaves about the roots, and induce the layers to shoot with more vigour. The above writer thinks that in this method of laying, two or three rows of layers may be had from one wall: taking care to lay the branches alternately, and to keep the pots plunged about two inches below the level of the ground.

The same writer advises in choosing vines from the nursery, to select those which have the strongest and longest shoots. And he observes, that where the above directions are properly attended to, the plants will be well rooted in the pots before autumn, and fit for planting in vineries, hot-houses, or other situations. And when they are to be planted out, they should, he thinks, be carefully cut off from the mother vine, and carried in the pots to where they are intended to be planted; taking care to preserve the balls as much as possible when they are turned out of them.

It is also added, that if the season be warm and fine, the grapes of the early kinds ripen very well on these layers before they are taken up; and, if properly managed, they will bear some fruit the first year after planting. One of the strongest shoots must be left nearly at full length, cutting it as high as the uppermost full bud, leaving nothing but

round

round well-ripened wood. If there are three ſhoots, the remaining two ſhould be cut ſo as to leave only two full eyes upon each, which ſhould be trained at length, as before directed, to produce fine wood for the next year. The ſhoot which was trained the preceding year ſhould then be cut down, leaving only two ſtrong eyes to produce wood for the following year; and ſo on every year, cutting the branches alternately: by this means the walls always may be kept covered with fine healthy bearing wood, and a great deal of time be ſaved in furniſhing hot-houſes, vineries, and other places. It is remarked, that this method of laying is practiſed with great ſucceſs by many nurſerymen in the neighbourhood of London.

In producing of vines by grafting, choice ſhould be made of cuttings for grafts, or ſcyons, from the beſt-bearing branches of the ſorts intended to be propagated at the ſeaſon of pruning. In general, the bottom part of the laſt year's ſhoot is to be preferred; but in well-ripened vigorous wood, any part of the ſhoot will anſwer, provided it be not too long jointed. Theſe cuttings ſhould be preſerved in pots filled with light ſandy earth till the time of grafting.

The periods for performing the operation are different according to the vines; for thoſe in the pine ſtove, the beginning of January may be proper, but the middle of March for thoſe growing in the open air. In general, they ſhould be grafted about three weeks before they begin to break into bud. And upon ſmall ſtocks not more than an inch in diameter, cleft-grafting is the moſt proper; but upon larger ſtocks, whip-grafting is to be preferred. In both methods, care ſhould be taken in fitting the ſtock and ſcyon together, and the operation ſhould be performed with great exactneſs; faſtening them together with baſs matting, and covering them with clay in the uſual way. After the operation, the ſcyon will ſometimes begin to puſh in a few weeks, but it frequently remains dormant two or three months; during this period the ſtock muſt be ſtripped of all its ſhoots as ſoon as they appear; and to preſerve the ſcyon in a vegetative ſtate, the clay muſt be kept moderately moiſt by wrapping wet moſs round it, and by keeping the moſs conſtantly ſprinkled with water. And when it has made ſhoots five or ſix inches long, the clay and bandage muſt be carefully taken off.

The method of grafting by approach is adviſed by ſome, however, as the beſt mode of raiſing vines. In this caſe, it is neceſſary to have the plant intended to be propagated in a pot. Strong plants that have been two or three years in pots are to be preferred; but plants from the nurſery may be potted, and grafted in the ſame ſeaſon, if brought into a hot-houſe or vinery. It is ſuggeſted that fine grapes and good wood may be obtained even the firſt ſeaſon by any of theſe methods, but particularly by the laſt; in which it is evident the graft has a double ſupport, as from the ſtock and the plant in the pot.

In this ſort of grafting, the clay and bandage ſhould remain two or three months after the graft has formed an union; for if it be taken off ſooner, the graft will be very liable to ſpring from the ſtock. The pot ſhould be plentifully ſupplied with water till the month of Auguſt, when the graft ſhould be ſeparated from the plant in the pot. Two or three inches of wood below the bottom of the graft may be left, but ſhould be taken clean off at the next pruning in winter.

The Syrian vine is recommended as the moſt proper for ſtocks, and plants of this ſort raiſed from ſeeds are greatly preferable for this purpoſe to plants either raiſed from layers or cuttings. See GRAFTING.

The principal advantages of the grafting mode of raiſing vines are; that if a wall ſhould have been planted with bad kinds, inſtead of ſtubbing them up, and making a new border, by which ſeveral years muſt elapſe before the wall can again be completely filled; in this way their nature may be changed immediately, as good grapes may be obtained from the ſame year's graft; and in a hot-houſe the grafts, if permitted, will frequently ſhoot thirty or forty feet the firſt ſummer; that in ſmall vineries or frames, where great variety could not be had in the common way, it may be procured by this means on the ſame plant; and that of the improvement of the various kinds, particularly the ſmall ones, which generally make weak wood. The method by inoculation may likewiſe have advantages in ſome caſes of a ſimilar kind.

When any of the vines that have been raiſed from ſeed do not prove of a good flavour, they are proper for grafting or inarching the finer ſorts of vines on; for, as the coarſer ſorts grow more vigorouſly than the finer, they are on that account more fit for grafting or inarching.

Vines will grow in almoſt any ſort of ſoil, but ſucceed the moſt perfectly in thoſe of the good dry, loamy kind, and where there is a mixture of calcareous materials, or in thoſe of other qualities which are dry and rich. However, where the land is of a wet retentive nature, or of the ſtrong, ſtiff, clayey quality, it is quite improper for the growing of theſe kinds of plants, as though they may luxuriate ſtrongly, they will produce an ill-flavoured ſour fruit; and the notion of many gardeners of placing a layer or bed of ſtones, bricks, lime rubbiſh, or other ſimilar materials, below their roots, in the view of checking their downward direction, and the over-luxuriance of the plants, thereby rendering them more fruitful, and promoting the ripening and flavour, though it may, in ſome meaſure, anſwer the purpoſe in particular inſtances, it is liable to ſtunt the growth of the trees, and cauſe the fruit to be ſmall and of little value.

It is further remarked, that the beſt manure for vines is a mixture of vegetable mould, rotten ſpit-dung, and freſh loam (turf and all); this ſhould be thrown in a heap, and frequently turned, for a year or two before it is made uſe of.

In regard to the proper ſituations for vines, they ſhould conſtantly have a ſouthern expoſure as full to the influence of the ſun as poſſible, never varying from the full ſouth, or a very little to the ſouth-weſt, as in this climate, this is neceſſary in order to the ripening and flavour of the fruit. In gardens they are uſually trained againſt walls, or other erections of a ſimilar nature; but in vineyards and other open places, againſt treillages, ſtakes, and other ſimilar works, formed in rows on the ſouth ſides of them, where poſſible, chooſing a riſing ground for the purpoſe.

For final planting out in theſe ſituations, ready-raiſed plants of two, three, or more years' growth, procured in ſome of the above modes, are moſtly uſed, being tranſplanted from the nurſery. But in order to form bearers as ſoon as poſſible, ready-raiſed plants of the different varieties may be had at the public nurſery-grounds in general, of a proper plantable ſize, and for immediate bearing, either in good-rooted plants in the full ground, or in pots fit for being planted out with balls of earth about them.

The proper ſeaſon for performing the work of planting them out is the early autumn, or the very early ſpring months. The buſineſs ſhould be done according to the nature and height of the material againſt which they are to be trained, in regard to the diſtance, and other circumſtances: thoſe againſt eſpaliers and ſtakes may be planted either together or in mixture with other kinds of fruit-trees, in

in rows ten or twelve feet apart, choosing warm dry sandy situations: in all the cases settling the earth about the roots by proper watering.

In all the different sorts of vines, the fruit is produced on the young shoots of the same year, which arise directly from the eyes or buds of those shoots which were afforded in the former year. This is a matter of importance, and deserves much attention in the work of pruning.

Methods of Pruning and Training Vines.—In the management of the vines, after being thus raised and trained, as they rarely produce any bearing shoots from wood that is more than one year old, care should be taken to have such wood in every part of the trees; for the fruit is always produced upon the shoots of the same year, which come out from buds of the last year's wood, as has been already seen. The method practised by gardeners is to shorten the branches of the former year's growth down to three or four eyes at the time of pruning; though some leave these shoots much longer, and think that by this practice they obtain a greater quantity of fruit: but what is gained in quantity is probably lost in quality; therefore the best method is perhaps to shorten the bearing shoots to about four eyes in length, as the lowermost seldom is good, and three buds are sufficient, as each will produce a shoot, which generally has two or three bunches of grapes; so that from each of those shoots there may be expected six or eight bunches, which is a sufficient quantity. These shoots must be laid in about eighteen inches asunder, as where they are closer, when the side-shoots are produced, there will not be room enough to train them against the wall, which should always be provided for; and as their leaves are very large, the branches should be left at a proportionable distance from each other, that they may not crowd or shade the fruit too much.

In the winter pruning of the vines, it is advised to make the cut just above the eye, sloping it backward from it, that if it should bleed, the sap may not flow upon the bud; and where there is an opportunity of cutting down some young shoots to two eyes, in order to produce vigorous shoots for the next year's bearing, it should always be done, as in stopping of those shoots which have fruit upon them as soon as the grapes are formed, which is frequently practised, it often spoils the eyes for producing bearing branches the following year. The usual season for this pruning is the end of October. But about the end of April, or the beginning of the following month, when the vines begin to shoot, they should be carefully looked over, rubbing off all small buds which may come from the old wood, which only produce weak dangling branches; as also when two shoots are produced from the same bud, the weakest of them should be displaced, which will cause the others to be stronger; and the sooner this is done the better. And in the middle of the last month they should be gone over again, rubbing off and displacing all the dangling shoots as before, and at the same time fastening up all the strong branches, so that they may not hang from the wall; for if their shoots hang down, their leaves will be turned with their upper surfaces the wrong way, and when the shoots are afterwards trained upright, they will have their under surface upward; and until the leaves are turned again, and have taken their right position, the fruit will not thrive; so that the not observing this management will cause the grapes to be a fortnight or three weeks later before they ripen: besides, by suffering the fruit to hang from the wall, and be shaded with the closeness of the branches, it is generally retarded in its growth; therefore, during the growing season you should constantly look over the vines, displacing all dangling branches and wild wood, and fasten up the other shoots regularly to the wall; and towards the middle of June the bearing branches should be stopped, which will improve the fruit, in doing which three eyes should always be left above the bunches. But though this is practised on those shoots which have fruit, it is not to be performed upon those which are intended for bearing the next year, as these must not be stopped until the middle of July, as by stopping them too soon, it may cause the eyes to shoot out strong lateral branches, and in that way injure them. In the summer season care should be taken to rub off all dangling branches, and train up the shoots regularly to the wall as before, which greatly accelerates the growth of the fruit, and admits the sun and air more freely to them, which is necessary to ripen and give the fruit a rich flavour; but the branches should not be too much divested of their leaves, as is the practice with some.

A late writer, Mr. Forsyth, has, however, attempted another mode of pruning and training vines, from trials made on vines planted against the piers of a south wall, among peaches, nectarines, and plums, &c. in which the fruit was so small and hard as to be unfit for the table. They had been trained upright, which induced such a luxuriance of growth, as made the sap to flow into the branches in the place of the fruit. He consequently let, it is remarked, in 1789, two strong branches grow to their full length without topping them in the summer, and in the following year trained them in a serpentine form, leaving about thirty eyes on each shoot, which produced one hundred and twenty fine bunches of grapes, weighing from one pound to a pound and a quarter each. Every one that saw them said that the large ones were as fine as forced grapes; while the small ones produced from branches of the same vine, trained and pruned in the old way, were bad natural grapes, and not above twice the size of large currants. And in order more fully to prove the success of the experiment, he next year trained five plants in the same way, allowing the shoots intended for bearing wood to run to their full length in summer, training them wherever there was a vacancy between the old trees; where there was none, he ran them along the top of the wall, without topping them. In winter he trained them in a serpentine manner, so as to fill the wall as regularly as possible; and they were, it is asserted, as productive as those in the former year. And after a three years' trial, he thought he was warranted to follow the same practice with the whole; when, in the year 1793, he sent, it is remarked, for the use of his majesty and the royal family, three hundred and seventy-eight baskets of grapes, each weighing about three pounds, without planting a single vine more than there were the preceding year, in which he was able to send only fifty-six baskets of the same weight; and those so bad and ill-ripened, that he was ashamed of them, as they were not fit to be sent to the table.

This, he thinks, sufficiently proves the great advantage that the serpentine method of training possesses over the common method. He advises, that the shoots should be brought as near as possible from the bottom of the vine, that the wall may be well covered. When the walls are high, and the shoots from the serpentine branches strong, they are sometimes let remain; but if the walls are low, and the serpentine branches produce weak shoots, they are cut out in the autumnal pruning, and the strongest of the young wood trained up in their room.

It is noticed, that as the size and fineness of the bunches of grapes depend in a great measure on the bearing wood being strong and well ripened, great attention should be paid

paid to these circumstances. Where the vines produce small bunches, they should be cut down to two or three eyes, in order to have strong wood for the ensuing year. And as it has been seen that vines bear their fruit on the wood that was produced the preceding year, when there is a great deal of old naked wood on them, as generally is the case, with some small weak shoots at the extremities, they should always be cut down as near to the ground as possible, in which case there will be no fruit for that year. But another mode is sometimes practised, which is, to cut every other shoot, leaving the old ones to produce some small grapes; when in the following year there will be plenty of fine wood, provided care be taken to nail in the strongest shoots, and pick off all the side-shoots that are produced from the eyes, pinching them off with the finger and thumb, or cutting them off with a sharp penknife close to the bud or eye; but never twisting them; as by twisting them, the bud that produces the grapes the next year is hurt; being always attentive to cut as near to a bud as possible, and taking care to lay in the wood very thin in the summer season, that the sun and air may be freely admitted to ripen it well, as by these means it will grow very strong. Great care should also be taken to keep the shoots nailed to the wall, which will prevent their being broken by high winds; picking off all the side-shoots every time they are nailed, which should be done several times during the summer months, according to the quickness of their growth. In fine weather they grow so very rapidly, that it is necessary to look them over once every fortnight or three weeks to have them in good order. The vines should never be suffered to run together in a cluster, and mat, as it infallibly ruins them for bearing the succeeding year. The shoots that have been trained in a serpentine manner, are advised by Mr. Forsyth to be topped, as soon as the grapes come to the size of very small green peas, at a joint or two above the fruit; but neither the leading shoot, nor that which is intended to bear fruit the next year, should ever be topped.

In the second year Mr. Forsyth never recommends the pruning of vines to be performed till the beginning of February, except in such seasons as are very forward. It is, however, the common practice with some to begin pruning soon after the fall of the leaf, before the wood becomes hard; but if a frost sets in before the wood is hard, in particular after wet summers and autumns, it is apt to be very much injured; he has frequently seen it almost killed after autumnal pruning. And he observes, that there is often fine weather in the months of October, November, and December, with sun and drying winds, which helps to ripen the wood after wet autumns.

It is likewise advised, when the vine-leaves begin to fall, to take a soft broom and sweep them off upwards in a gentle manner, which will be of great service in assisting to harden the wood. In beginning to prune in February, it is recommended always to make choice of the strongest and longest shoots, leaving them as long as the eyes are found good and plump, and the wood round; but by no means to leave them when they become flat, as in that case they seldom bear fruit; and if they do, it will be very small. Mr. Forsyth never lays in any that has less than fifteen, and from that to thirty good eyes, according to the strength of the shoot, which will produce two bunches from every good eye. He has had seventy bunches of grapes from one shoot. The shoots that have borne fruit in the preceding year should be cut out the next year, except where the wall is to be filled and the shoots are very strong. Plenty of fine healthy young wood is easily provided, if care be taken in the winter pruning; therefore, none should be left but the fine strong wood, cutting constantly at the second, third, or fourth eye; rubbing the lowest bud off, and that which comes out at the joint between the new and last year's wood. By these means as much fruit will, he contends, be procured from these short shoots, as by the common way of pruning. It is necessary to leave two or three of the strongest shoots for next year's bearing wood, and never to top them. When there is not room to train them, they may be led over the tops of the other trees, if the vines are planted against piers; or be run behind the standards, if there be any, which is generally the case where the walls are high. In this way all the wall will be covered, which will have a very beautiful appearance when the fruit is ripe, besides furnishing a plentiful supply of fine grapes. The shoots at the bottom of the wall may be run behind the dwarf-trees, or be tacked down over the top of the wall on the other side where the walls are low. Mr. Forsyth has had very fine grapes on east and west walls, in good seasons, between peaches, plums, &c. particularly when the trees are young. In these cases he advises to keep cutting in the vines as the other trees grow and fill up the walls. He also trains them over the tops of trees on each side; which, he asserts, never does any harm to the trees below, provided they are kept nailed to the wall. He has also planted vines between trees on north and east aspects, and trained them over the tops of the south and west walls to fill the upper parts, till the peaches and nectarines cover them. He then cuts away part of the vines, leaving only as many shoots as he may think necessary. Two years ago, he states, he removed some old apricots that covered a wall about 165 feet long, and planted them against a new wall, leaving five vines that were planted against the piers. These five plants have, in the course of two years, covered the above wall from top to bottom, and bear plenty of fine grapes every year. He remarks that he also moved an old vine on a wall near to the above, and cut it in pretty close, when it has in three years spread twenty-six yards, and bears very fine fruit. And against one of the piers had, he observes, been planted a black Hamburgh grape, and at the other side of the same pier a muscadine, at the distance of about two feet from each other; he pruned them both according to his method, and the second year after, they produced 1100 bunches of fine grapes. It is added, that he also tried an experiment by taking some shoots from a south wall, opening the ground deep enough to lay them in across the footpath at the distance of about four feet from the wall, and tied them to stakes, training them as espaliers, laying in the wood as directed for walls, and keeping them as low as possible, that they might not shade the bottom of the wall; he also pruned them as he does those against walls, laying the shoots in very long, except those that were intended to bear fruit next year, from which he took off all the side-shoots and runners against the wall and espaliers. In a favourable season these bear, he asserts, very fine fruit, better than what is got from the walls by the old method of pruning.

The use of the composition prepared by him is advised as soon after pruning as possible; for as the vine is very porous, it soon imbibes the wet and moisture, which brings it quickly to decay. He adds further, that if at any time a vine should be cut late in the season, it will be apt to bleed much; in which case the powder should be applied, repeating the application till the bleeding stops. He states, moreover, that he cut two strong vine-branches in the month of June, and three more in July, in very hot weather, on purpose to try the effect of the powder in stopping the bleeding. The sap rose so strong, that it worked out at the top in a froth; he applied the powder, which in a short time entirely stopped it.

it. These directions are chiefly for vines on the natural wall, though the same method has been advised to be practised for forced grapes. The situations in which they are placed should be towards the south, and the earth quite dry and light.

The above writer still further advises, that after the grapes are set and begin to swell, to water them with the barrow-engine, sprinkling them all over the leaves and fruit, pressing the fore-finger over the top of the pipe; by which the water can be thrown as fine as small rain, which will wash all the dust off the vine and leaves, that are frequently covered with it, especially where the garden is near a public road. The insects should likewise be washed off the trees. In fine weather he sprinkles all the wall-trees three times a week, which keeps them clear from insects, and promotes the swelling of the fruit; but this operation must never, he says, be performed when the nights are cold and frosty. The sprinkling of the trees should be begun when the sun is in an oblique direction, or gone off the wall, which may be about four o'clock on a south aspect; as by doing it at this period the leaves will have time to dry before night, and so prevent the frost, if there should be any in the night, from injuring them. In very hot and dry weather the trees should have a good bottom watering once a week, which will forward the swelling of the fruit. Vines require a great deal of watering; but when the fruit is fully swelled, you should leave it off, particularly when the nights begin to get cold, as it would hurt the flavour of the fruit.

In order to preserve the grapes, as soon as the large fly makes its appearance, plenty of bottles a little more than half filled with some sweet liquor should be provided to entice the flies to enter them, where they will be drowned. The bottles should be hung on the nails at proper distances all over the vines, and also some of them placed at the bottom of the walls. The blue fly comes much earlier than the wasp, and is no less destructive to the fruit. It is therefore necessary to hang up the bottles betimes, in order to destroy as many of them as possible before the wasp makes its appearance, to have the bottles ready for this second enemy.

And when the grapes begin to ripen, the birds begin to attack the fruit; when it is necessary to bag some of your fine handsome bunches, but to bag them all would be an endless trouble where there is a full crop and a large garden. Of course where the bunches are very thick, the quickest way is, he thinks, to cover the trees with nets, or buntine (a kind of stuff of which ships' colours are made), which will admit a free air to the grapes, and dry soon after rain. They will also in the spring, he thinks, be a good covering for the trees in cold, wet, or snowy weather. The bunches of grapes should always be kept under the shade of the leaves till they begin to ripen; when you may begin to pick off the leaves which cover the fruit (leaving those a little above it to be a shelter from the wet and frost in the nights): this will assist the ripening of the fruit; and take off only a few leaves at a time, according to the quantity of grapes to be gathered at once: by these means the fruit will continue three times as long in succession as it would if the leaves were picked off all at one time. He has often seen all the leaves taken off from the fruit soon after it was set, which prevents it from swelling, and it becomes hard and small, and generally cracks. When the leaves are not too thick, they admit, he asserts, the rays of the sun to pass through, and a warm glow of heat will be reflected from the wall.

Further, it is often convenient to let the grapes hang as long on the walls as possible; he has often let them hang till the middle of November, only covering them with nets, or buntine. But when the frost begins to set in sharp, they should then be gathered. Where there are several bunches on one branch it may be cut off, leaving about six inches in length, or more, of the wood, according to the distance between the bunches, and a little on the outside of the fruit at each end; both ends being sealed with some common sealing-wax, such as wine-merchants use for sealing their bottles with, which you may buy at the wax-chandler's; then hang them across a line in a dry room, taking care to clip out with a pair of scissors any of the berries that begin to decay or become mouldy, which if left would taint the others. In this way he has kept grapes till the 6th of February; but if they are cut before the bunches are too ripe, they may be kept much longer than that period.

They may also be kept, he contends, by packing them in jars, (every bunch being first wrapped up in soft paper,) and covering every layer with bran, which should be well dried before it is used, laying a little in the bottom of the jar; then a layer of grapes alternately, till the jar is filled, then shaking it gently, and filling it to the top with bran, laying some paper over it, and covering the top with a bladder tied firmly on to exclude the air; when the top or cover of the jar should be put on, observing that it fits as close as possible, placing them in a room where a fire is kept in wet or damp weather.

Methods of forcing Vines.—This is performed in different sorts of buildings contrived for the purpose; such as hot-walls and vineries, as well as by hot-houses or stoves. See Vinery.

It is suggested by the Scotch Forcing Gardener, that in the former cases, when the borders have been prepared and made up in the manner directed under the head Vinery; when proper plants of one or two years' growth in pots cannot be procured, cuttings should be made use of. Others, however, prefer cuttings in all cases, planting two in each hole, to guard against failure, the weakest, where both grow, being afterwards removed. These should be planted about the beginning of April, being chosen from good-bearing vines, and such shoots as are well ripened, otherwise they never make good plants. The distance they should be allowed to remain is about six feet. In planting them out, holes should be opened with a spade, about eighteen inches deep; the cuttings being laid in the holes a little sloping, the earth being then filled into the holes, and gently pressed with the foot to them, and raised in a heap so as just to cover the uppermost eyes, afterwards applying a little mulch on the surface of the ground about them to prevent the sun and air from drying the earth; and when the spring is very dry, a little water should be given once a week.

Under this management they usually make strong shoots the first summer.

But the above writer, where rooted plants are employed, advises the pits to be half filled with vegetable mould, and the plants to be taken carefully out of the pots with their balls entire, and, unless when rooted, be placed in that manner in the pits, filling them in with vegetable mould, and settling them with a little water. This work, in his opinion, may be performed any time from the beginning of November to the 1st of March, with equal success. But though the above distance of planting may be proper when the vines are full grown, it may be beneficial to have them put in at half that distance at first; as a crop or two may be obtained before it is necessary to thin them out; two of a kind being placed together for the greater convenience of thinning.

The management of the vines, for the three first years after planting, is the same as practised for those against common

common walls, which has been described above, being, however, encouraged as much as possible, and the shoots not left too long, or too many in number on each root, that they may be duly ripened and prepared for bearing the fourth year, which is the soonest they should be forced; when any sorts of fruit-trees are forced by fire too young, they seldom continue long in health; so that what fruit they produce is small, and not well-flavoured. By the middle of June the grapes will be almost full grown, therefore the glasses may be kept off continually in the day-time, unless the season be very cold and wet, in which case they must be kept on, and only opened when the weather is favourable; for as the racy vinous flavour of these fruits is increased by a free air, so during the time of their ripening they should have as large a share as the season will admit to be given them. Mr. Nicol advises in the first and second seasons, to keep the border in a moderately moist state while the plants are growing; but, after their growth begins to abate, particularly the second season, to withhold the waterings by degrees till it is quite stopped, in order to make them harden and ripen their shoots for the production of a crop the third year. Water frequently with the drainings of a dunghill. And wash with the hand-engine twice or thrice a week in the evening, in order to refresh and keep the plants clean. Steaming is, he thinks, unnecessary.

And in the third season, keep the border also in a moderately moist state, till the fruit begin their last swelling. Then give large quantities till they begin to colour; after which, entirely withhold it till the crop is gathered; and then give two or three hearty waterings, to recover the state the border ought to remain in for the winter.

He likewise advises to wash twice or thrice a week till the flowers begin to open, then to withhold till the fruit is fairly set; washing again till they begin to colour, and then withhold entirely for the season. And in the interim of washing, to steam every night when the fire is at the strongest, by pouring water on the flues till you cannot see an object at the distance of two or three yards: and repeat this early in the morning, if the temperature of the house require the making of fires, or if there is a sufficient heat in the flues to produce it, even in a middling degree.

The insects which infest the grape-house are chiefly the green fly, thrips, red spider, and wasp. The two first are, Mr. Nicol conceives, easily destroyed by a fumigation of tobacco; the third is kept under by the engine in summer; and the last, by the destruction of their nests, phials filled with honey and water, or sugar and small beer, and bird-lime. All these methods are, however, sometimes ineffectual for the destruction of wasps, where they abound in great number; and their fondness for grapes renders it sometimes necessary to inclose the bunches in bags of gauze, or silken paper, which is a misfortune; as the grapes, by being so much excluded from the action of the sun and air, fall off very much in flavour. Birds must also be guarded against by some means or other.

All sorts of grapes should continue on the trees till fully ripe. It is advised by some, that these vines should not be forced every year, but under good management every other year, or every third year. Of course, in order to have a supply of fruit annually, there should be a sufficient extent of walling to contain as many vines as are necessary for two or three years; and by having the frames in front moveable, they may be shifted from one part of the wall to another, as the vines are alternately forced. These hot-walls are commonly planted with early kinds of grapes, in order to have them forward in the season; though some think it hardly worth the trouble, in order to have a few grapes earlier by a month or six weeks, than those against common walls. The sorts of vines most useful in this mode of culture have been mentioned above.

After these vines are grown to full bearing, they must be pruned and managed after the same manner as has been directed for those against common walls, with this difference only, that in those seasons when they are not forced, they should be carefully managed in the summer for a supply of good wood, against the time of their being forced, divesting them of their fruit for the purpose.

But when the vines are forced, the only care is to encourage the fruit, without having much regard to the wood, so that every shoot should be pruned for fruit, and none of them shortened for a supply of young wood; as they may be so managed by pruning in the years of their resting, as to replenish the vines with new wood. Those which are designed for forcing in the spring, should be pruned early in the autumn before, that the buds which are left on the shoots may receive all possible nourishment from the root, and at the same time the shoots should be fastened to the treillis in the order they are to lie; but the glasses should not be placed before the vines till about the middle or end of January, at which time also the fires must be lighted; for if they are forced too early in the year, they will begin to shoot before the weather is warm enough to admit air to the vines, which causes the young shoots to draw out weak, and their joints too far asunder to afford a good and full supply of fruit.

When the fires are made at the above period, the vines begin to shoot the middle or latter end of February, which is six weeks earlier than they usually come out against the common walls; so that by the time that other vines are shooting, these will be in flower, which is early enough to ripen them. The fires should not be made very strong in these walls; as, if the air is heated about ten degrees above the temperate point of the gardener's thermometer, it will be sufficiently warm to force out the shoots leisurely, which is much better than to force them violently. These fires should not be continued all the day-time, unless the weather be very cold, and the sun does not shine to warm the air, at which time it will be proper to have small fires continued all the day; for where the walls are rightly contrived, a moderate fire made every evening, and continued till ten or eleven o'clock at night, will heat the wall, and warm the inclosed air to a proper temperature; and as these fires need not be continued longer than about the end of April, (unless the spring should prove very cold,) the expence of fuel will not be very great, because they may be contrived to burn coal, wood, turf, or almost any other sort of fuel: though where coal is to be had reasonable, it makes the evenest and best fires, and will not require so much attendance. When the vines begin to shoot, they must be frequently looked over, to fasten the new shoots to the treillis, and rub off all dangling shoots; in doing of which great care must be taken; for the shoots of these forced vines are very tender, and very subject to break when any violence is offered. The shoots should also be trained very regular, so as to lie as near as possible to the espalier, and at equal distances, that they may equally enjoy the benefit of the air and sun, which are absolutely necessary for the improvement of the fruit. When the grapes are formed, the shoots should be stopped at the second joint beyond the fruit, that the nourishment may not be drawn away from the fruit in useless shoots, which must be avoided as much as possible in these cases, no useless wood being left to shade the fruit, and exclude the air from it by the leaves.

In speaking of the temperature of the vinery, Mr. Nicol

Nicol recommends, that fire ſhould not be lighted the firſt ſeaſon, unleſs it proves cold or wet, and the wood is not ripened in good time; in which caſe, a moderate fire heat, from the 1ſt of September, would greatly encourage the growth, and promote the ripening of the wood. And as the plants will bear gentle forcing the third ſeaſon, it will be adviſable (for that purpoſe) to forward them the ſecond in a moderate degree. For this purpoſe, let moderate fires be made about the 1ſt of April, (by which time the plants will begin to vegetate,) ſo as to raiſe the air of the houſe at ſix in the morning, and eight at night, to about 55°; in the courſe of a fortnight increaſe it to 60°; and in another fortnight to 70°; at which let it continue till the 1ſt or middle of June, and then be totally diſcontinued for the ſeaſon. But in the third ſeaſon, the forcing may commence on the 1ſt of March, without injuring the plants; and, if carefully performed, a fair crop of fruit be obtained. Begin then by making and regulating the fires, ſo that the thermometer may not ſtand above 50° at ſeven in the morning, and eight or nine at night; keeping it ſo till every eye in the houſe is broken, and then gradually increaſe it to 60, 65, 70, and when the bloom begins to open, to 75 degrees. He has already hinted, that vegetation in forcing ought to be brought on as it were by ſtealth; which is the cauſe of his adviſing the above gradual and progreſſive riſe in the climate of the houſe: and where this is not particularly attended to in the firſt ſtage of the operation, diſappointments will follow, as the plants will not break their eyes (and of conſequence not ſhew fruit) regularly. He adviſes to keep the air of the houſe as near to 75°, till the fruit is fairly ſet, as poſſible, as grapes in general are found to ſet beſt in a moiſt heat of about 75°. But he has found by experience that all the kinds of frontinacs require a much greater degree of heat, not only when in flower, but from the time the cluſters are diſtinguiſhable; while thoſe of the white ſweet-water, and white royal muſcadines, require a much leſs degree; the former being apt to curl up and become ſterile for want of heat, and the latter to produce a greater quantity of ſmall berries in conſequence of too much. Therefore, where there is any difference of climate (which is ſometimes occaſioned by the placing of the fire-places) in the houſe, this hint ſhould be taken advantage of. But it may then be let down to 70° or 72°; at which endeavour to keep it till the crop is all gathered; after which, no further attention to the climate is neceſſary. It is added, that in the following ſeaſon, the forcing may, when requiſite, be begun a month or ſix weeks ſooner; as about the middle of January, or 1ſt of February; in which early ſeaſon great attention muſt be paid to the regulation of the fire-heat.

It is further obſerved, that a month may be gained every ſeaſon (where there are two or three grape-houſes; and it is required to have grapes at a very early ſeaſon), until you begin to force the firſt ſo early as the 1ſt of October; but where there is but one or two houſes, the 1ſt of March in the one caſe, and of January in the other, is, he thinks, quite ſoon enough.

It is adviſed in the ſame work, that as the ſeaſon advances, and the weather becomes warm, there ſhould be a proportionable ſhare of free air admitted to the vines every day, which is abſolutely neceſſary to promote the growth of the fruit; but the glaſſes ſhould be ſhut cloſe every night, unleſs in very hot weather, otherwiſe the cold dews in the night will retard it. The bunches in ſome of the ſorts ſhould be carefully looked over, and the ſmall grapes cut out with very narrow-pointed ſciſſors, in order to thin them. Mr. Nicol alſo recommends a due portion of air to be admitted every day after planting, from ſun-riſe to ſun-ſet, until the buds begin to break; after which a more punctual regulation ſhould be obſerved, being guided much by the temperature of the weather, and the quantity of ſunſhine, but admitting leſs or more every day, unleſs the ſeverity of froſty winds renders it imprudent to do ſo. And as the ſummer advances, to be very liberal in this article in ſerene weather; as it greatly tends to the ſtrengthening of the young ſhoots. It is, he thinks, a practice with many to uncover grape-houſes in winter; this he never did, not ſo much diſapproving of the practice, as owing to the expence attending it, not only in removing and putting on, but in breaking the glaſſes, and waſting the flues by the extremes of froſt and blanching rains. His method is to admit an equal and free circulation of air, by opening the ſaſhes alternately at top, bottom, and middle, to the extent of at leaſt a third part of the whole covering, and letting them remain ſo day and night; never ſhutting up for any cauſe but that of too much wet. In the ſecond ſeaſon, much the ſame regulation ſhould be obſerved as above; and, if fire is applied for the forwarding of the wood, due attention ſhould be paid at that time, as the ſudden breaking out of the ſun in dull weather, when there is a good deal of fire-heat in the houſe, is attended with much danger. Suppoſing the plants to have made good wood for the production of a crop, and that they are to be forced from the 1ſt of March, let the houſe be ſhut up at night from the middle of February, and have the ſame quantity of air in the day it enjoyed all winter. From the time the fire is lighted, give a moderate quantity every day if poſſible, till the buds have all broke, to the extent that in ſun-ſhine the thermometer may not riſe more than ten degrees above the fire-heat medium; but after the buds have broke, and the temperature of the houſe is increaſed, be careful in the admiſſion of froſty, or foul damp air. The latter may be entirely excluded, except perhaps for an hour or two in the middle of the day; and the bad effects of the former, by opening the top ſaſhes *only* a little way, to paſs off the rarefied air occaſioned by the ſun-heat, which is frequently very intenſe in clear froſty weather in the months of March and April. In clear ſun-ſhining weather, his mode of practice is to give and take away air by degrees; that is, by giving half air about eight in the morning, full air about ten or eleven, reducing to half air about two or three, and ſhutting up about four or five in the afternoon, according to the ſeaſon. It is neceſſary from the time the fruit begins to colour, to give large portions of air till the crop is all gathered, the flavour being much augmented by it; and afterwards to expoſe the houſe night and day for the winter, as directed above; ſhutting up, however, if much wet or hard froſt ſhould happen during the firſt ten or twelve days after the plants have been pruned for the winter ſeaſon.

In the latter mode of forcing, or that in hot-houſes or pine-ſtoves, after they have been properly prepared and rendered dry in the bottom parts, the area ſhould be filled up with a compoſt-mould compoſed of one-fourth ſtrong loam; one-fourth turf, from a paſture where the ſoil is a ſandy loam; one-fourth ſweepings or ſcrapings of pavements or hard roads; one-eighth rotten cow and ſtable-yard dung mixed; and one-eighth of vegetable mould from decayed oak-leaves: the graſs muſt be well rotted, and the whole worked together till it is uniformly mixed. Where ſandy loam cannot be had, common ſand may be uſed; and the mould of rotten ſticks or old woods, or from hollow trees, may be ſubſtituted for the decayed leaves.

When the border has been prepared, if the weather permit

mit, the vines may be planted at the end of February, or the beginning of March, in the front of the hot-houfe or ftove; having firft taken the precaution to put a little mofs round the upper part of each ftem, with two or three folds of paper over it, tied with bafs matting, to prevent the eyes from being injured in putting the plants through the holes in the wall. A hole, two feet over, and one foot deep, fhould be made oppofite to each rafter, and clofe to the front wall, making the mould taken out of the holes fine, and adding a little of the compoft. Then turn the plant carefully out of its pot, and put the upper part through the hole. If the fhoot juft reach the bottom of the rafter, when planted, it is fufficient; but as the earth may fettle a little, it is better to allow two or three inches more. In clofing the mould to the plant, care fhould be taken to preferve the roots, their fibres being exceedingly brittle. Lay a thin coat of rotten dung over the mould, and give the plant a gentle watering; then take off the bandage, and faften the top of the fhoot to the rafter. Only one fhoot fhould remain on each plant. Two may be left for a time; but when one is fecure, the other muft be taken off, but not clofe to the old wood, as that would occafion it to bleed, and greatly injure it.

It is obferved in addition, that from the time the vines begin to grow, they will require conftant watering, efpecially in dry weather, and before the roots have penetrated fufficiently deep into the border or earth in which they are planted. It is the common practice, in thefe cafes, to train a fhoot up to each rafter; and if the rafters be not a fufficient depth to keep the leaves of the vines from touching the glafs, to have iron pins, of about nine inches in length, fixed at proper diftances under each rafter; which fhould have a fmall hole or eye at the bottom, through which a fmall iron rod or ftrong wire fhould be thruft for the fupport of the branch, which pins or wires fhould be painted.

Mr. Forfyth, however, remarks, that when vines are trained ftraight up the rafters in this manner, they only throw out a few eyes at the top, the reft of the branch being naked; he therefore advifes the ferpentine method, as much preferable.

The plants often fhew fruit at one year old, but it fhould not be fuffered to ftand, except a fingle bunch, to afcertain the fort. In the fummer feafon, the fhoots fhould be conftantly trained, keeping them regularly faftened to the rafters; divefting them of their wires and lateral fhoots, and guarding them well againft the red fpider and other infects.

The vines may in general be fuffered to run two-thirds of the length of the rafters before they are ftopped; and thofe which grow remarkably ftrong, the whole length. When thefe fhoots are ftopped, which is done by pinching off their tops, they will, in general, pufh out laterals, at three or four eyes on the upper part of the fhoot, which fhould be allowed to grow twelve or fourteen inches before their tops are pinched off; when thefe in their turn will pufh out other laterals, which fhould be pinched off at the fecond or third joint; and thus the fap may be diverted till the end of the feafon.

When the leaves begin to fall is the beft feafon for pruning. In the firft feafon, fuppofing the vines to have grown with equal vigour, the fhoots may be pruned alternately to three, four, or five eyes, or about twenty feet; but when they have grown moderately ftrong, the fhoots fhould be pruned down to about eleven feet; as by this alternate pruning the former fhoots will make fine wood for the fucceeding feafon, and the latter will produce a crop of fruit; after which, thefe fruit-bearing fhoots muft all be cut down nearly to the bottom of the rafters. But when any of the plants appear weak, and have not made fhoots more than eight, ten, or twelve feet long, it will be proper to prune every fhoot down to two, three, or four eyes. In performing the work, the fhoots fhould be taken off with a clean floping ftroke, about half an inch above the eye, making choice of a bold eye to terminate the fhoot, and faftening it to the rafter in a complete manner.

The vines in pine-ftoves begin to make weak fhoots early in January; the houfe being then kept warm on account of early crops raifed in moft hot-houfes. But when it is kept to a proper degree of heat for pines during the winter months, they feldom begin to pufh till about the middle of February. It is ufual for them to pufh only towards the ends of the fhoots, the other eyes remaining in a dormant ftate, and caufing a long fpace of naked wood; but to make them pufh more generally, as foon as the fap is in motion, the houfe fhould be kept for a fhort time a few degrees warmer than ufual. In the morning the thermometer fhould be five or fix degrees above temperature, and in the day-time the houfe be kept as warm as the weather will permit. It will alfo be neceffary to guard the ftem of the vine on the outfide againft froft; for one fevere night would greatly injure, if not totally deftroy, the hopes of a crop. This may be done by wrapping the part expofed round with mofs, faftened thick with bafs matting; which covering fhould remain on till fpring frofts are over, and then the ftem be wafhed well to clean it. The vines fhould be divefted of the leaft promifing and fupernumerary fhoots as foon as poffible, and great care fhould be taken not to leave too abundant a crop; as a few bunches in a high ftate of perfection are preferable to many in a poor ftate.

At the time of flowering, fhould the weather prove hot and dry, with brifk winds; to prevent the berries of different forts from falling off at the time of their fetting, it is proper to water the roots of the vines plentifully, to keep the houfe as clofe as the weather will permit, and to water the walks and flues in the hot-houfe conftantly, efpecially late in the evening, when the glaffes fhould be immediately clofed, by which a beneficial fort of dew is produced.

In thefe fituations, when the grapes are at their laft fwelling, are becoming tranfparent, and change from green to red or black, and till they are nearly on the point of being ripe, plentiful fupplies of water, efpecially if the feafon prove hot and dry, fhould be given to the vines.

After the fruit is cut, no other management is required till the pruning feafon, but that of taking off the lateral fhoots in the fame manner as in the preceding cafe. But in the next winter's pruning, all the vines that produced a full crop of fruit fhould be cut down nearly to the bottom, that is, to the lowermoft fummer fhoot, which fhould alfo be cut down to the firft or fecond eye; while all thofe that were cut down nearly in the preceding feafon, and which will, in general, have made very ftrong wood, muft be left to the length of twenty-one or twenty-two feet each, with the intention of producing a full crop of fruit the following feafon.

The management of them during the next fummer will be nearly the fame as in the preceding; only, as they have increafed in ftrength and fize, they will be enabled to produce and fupport a larger burthen of fruit. But the crop fhould always be proportioned to the fize and vigour of the plants; but whilft they are young, great moderation fhould be ufed as to the number of bunches that are allowed to ftand and ripen. They fhould be well thinned when the berries are about the fize of a fmall fhot. And the main fhoulders,

ſhoulders, as alſo the leſs projecting parts of the bunch, ſhould be ſuſpended by ſmall ſtrings to the rafters, and every part raiſed to a horizontal poſition. In thinning the berries, great care ſhould be taken to leave all the moſt projecting ones on every ſide of the bunch. In very cloſe-growing bunches, it will be neceſſary to clip out more than two-thirds of the berries; in ſome one-half; but in the looſe-growing kinds, one-third is generally ſufficient. By this means the remaining berries will ſwell well, grow to a great ſize, and not be ſubject to rot; as they are apt to do in a hot-houſe, when they are wedged together in a cloſe manner.

It is obſerved too, that not only the rafters or roof of the hot-houſe, but the back wall alſo above the flue, may be furniſhed with fruit. For this purpoſe, let every fourth or fifth vine-plant be trained in one ſhoot quite to the top of the rafter, and then directed ſideways ten or twelve feet along the top of the back wall. At the winter's pruning, bring down the part of the ſhoot perpendicularly, and cut it off at one foot above the top of the flue. The next ſpring encourage only two ſhoots from the two extreme or lowermoſt eyes of each ſhoot ſo brought down, and train them in a horizontal direction one foot above the top of the flue. Theſe ſhoots, however, will grow with greater readineſs, if they are trained upwards during the ſummer; and they may eaſily be brought to the deſired poſition at the next winter's pruning. They will then form againſt the back wall the figure of the letter T inverted. And in the next ſeaſon the horizontal ſhoots will produce new wood from almoſt every eye, provided all the ſhoots be pinched off from every other part as ſoon as they appear; laying in the ſhoots from one to two feet apart, according to the kind of vine. And it is adviſed in theſe caſes, to train all the ſhoots in a perpendicular direction, and, provided they are ſtrong and vigorous, to ſuffer them to grow to the length of five or ſix feet before they are ſtopped; but all theſe muſt be cut down to two or three eyes at the next winter's pruning. And only one ſhoot ſhould be permitted to riſe from each ſpur the following ſeaſon; and though they will in general be ſufficiently ſtrong, and produce two or three bunches a-piece, yet only one bunch ſhould remain on each ſhoot: theſe will then be large and fine, and the wood will be greatly benefited by ſuch practice. But theſe ſhoots muſt be pruned next winter very differently. One ſhoot muſt be left four feet, that next it only a few inches long, and ſo alternately. It is added that the vines on the rafters will require a management in future ſeaſons nearly ſimilar to that deſcribed above; and though it may not be adviſable to prune them alternately ſo near to the bottom of the rafters as was directed for the two preceding ſeaſons, it will be frequently found neceſſary to cut an old ſhoot down to the lowermoſt ſummer ſhoot, as near to the bottom of the rafter as can be. The ſide-ſhoot on the other rafters ſhould not be permitted to ramble over the adjoining lights; but at the end of every ſeaſon it will be proper to cut ſuch ſhoots down to the ſecond or third eye next the old wood, provided the bottom eyes are bold and ſtrong: this muſt be done not only to ſtrengthen the vines, but alſo to prevent the roof of the houſe from being too much crowded with old wood. Whilſt the vines are young, one rafter will ſuffice for a vine-plant; but when they become older, they will require a larger ſpace; eſpecially the ſtrong-growing kinds, which produce large leaves and bunches of fruit. It will be proper therefore to train ſhoots ſideways on the wall-plate, from the ſtem of the plant, immediately at its entrance into the houſe. Theſe ſhoots ſhould be carried up the adjoining rafters, and the plants growing againſt ſuch rafters muſt be taken entirely away; except it ſhould happen that the plant growing againſt ſuch rafter is trained forward to furniſh the back wall. And when a vine-plant occupies two or more rafters, it will be right to prune occaſionally, particularly whilſt the vine is young, one or more of ſuch ſhoots down nearly to the bottom of the rafter, as this will not only contribute to ſtrengthen the plant, but afford means to furniſh the rafters with a ſucceſſion of young wood. When the ſhoots are thus conducted to different rafters, every one may be conſidered as a ſeparate plant, and be trained up in one ſhoot; requiring management ſimilar to that mentioned above. Mr. Nicol, however, rejects the method of planting the vines on the outſide of the houſes, and his reaſons are theſe: firſt, he thinks it unnatural that one part of a plant ſhould be as it were in Greenland, and the other in the Weſt Indies; and ſecondly, becauſe he is convinced that no plant (eſpecially the pine) will live and thrive as well under the ſhade of another, as when expoſed to the free ſun and air. To obviate theſe objections, he plants the vines in the lobbies between the ſtoves and peach and grape houſes; introducing them through the partitions, and training them horizontally on trelliſes fixed againſt the back walls and upright ſaſhes in front. By which means he renders each of the ſtoves as good as any grape-houſe, without being in the leaſt injurious to the pines.

In theſe caſes, he ſtates that the front walls of the lobbies were built on pillars; and a border, both without and within, prepared for the plants, in the ſame manner as for the grape-houſe. It is added, that in one trial, the ſecond year after introduction into the ſtove, the plants completely filled the whole trellis; and a fine crop, the third year, gave a luſtre and richneſs to the houſe (in conjunction with a good crop of pines) highly gratifying.

He remarks farther, that the ſame methods in regard of watering, waſhing, and ſteaming, are to be practiſed here as in the grape-houſe. Air is admitted ſolely for the ſake, and to anſwer the nature, of the pines; the temperature of the houſe is alſo regulated for their ſakes. But the mode of training and pruning is very different from that in the grape-houſe. Here, you have it not in your power to bring on vegetation in that ſlow manner as in the grape-houſe; and conſequently, were the ſhoots to be laid in at as great lengths, they would only break perhaps a few eyes at the extremities, and the reſt remain naked. This he found from experience to be the caſe; although it did not happen for the firſt three or four years, owing to the youth and vigour of the plants: but when they had exhauſted themſelves a little by bearing a few crops, they began to break their buds in the manner above ſtated. He therefore made it a practice to train them only to five or ſix feet in ſummer, and ſhorten them down to one or two in the pruning ſeaſon; by which they generally broke all their eyes, and produced plenty of fruit. He further ſtates, that in one houſe he tried, for two ſeaſons, to produce crops by laterals; but found that method attended with more inconveniency than the above, from the difficulty of procuring a proper ſucceſſion of ſtrong ſhoots to produce the laterals, without which they bear very inſignificant cluſters. He alſo, in the other houſe, produced a ſecond crop, for two ſeaſons; but finding it to exhauſt the plants very much, he diſcontinued it; the more eſpecially, as, having ſo many compartments for grapes, the practice of it was the leſs neceſſary. The method is, he remarks, this: juſt about the time the fruit is half ripe, and when the under part of the ſhoot is alſo ripe to the length of about two or three feet, and the extremity of it in a growing ſtate, ſhorten it at about two or three feet above the ripe part. It will puſh again,

again, and will generally bring two clusters. Sometimes, also, the second and third eye will push, and bring a cluster or two. In winter pruning, shorten down the first, or spring-made part of the shoot, to two or three feet. This method may be repeated, he thinks, with pretty good success once in two or three years: but, if done every year, it will (in the course of three or four years) occasion the cutting of the plants down to the ground, in order to make them put forth a fresh stock of wood. He adds, however, that in the event of severe frost, and the plants being in an early state of vegetation, the border on the outside should be covered with a quantity of stable dung, or long litter, to prevent the roots from being injured by the weather. And unless the plants are wished to produce a second crop, they must not be pruned for good sooner than October, and at the same time, that operation should not be deferred longer than the first week of November, lest, when they begin to vegetate, they should bleed. He concludes by observing, that grape-vines will bear forcing, and last for many years, when under judicious management.

Some useful remarks have lately been offered, by the writer of a paper in the second volume of the Transactions of the Horticultural Society of London, on the management of the grape in forcing-houses, in the view of improving the quality of the fruit. There are some circumstances attending the state of vegetation in forcing-houses, it is said, which are not sufficiently regarded by gardeners in general, a strict attention to which is, however, absolutely indispensable for obtaining good fruit of this sort. When a vine is planted in a forcing-house, it receives, it is said, an increase of warmth from the solar influence operating upon the confined internal air, or from artificial heat communicated by the flues, or conjointly from both these sources. In each such case, when the foliage is expanded, a large portion of moist vapour is, it is maintained, given out from the under sides of the leaves, and becomes mixed with the air in the interior of the house. Plants will not only live, but grow with greater rapidity than ordinary, in a moist atmosphere, if the moisture do not exceed certain bounds. Under these circumstances, however, the annual shoots become large, soft, and spongy, and the fruit, notwithstanding it may have a promising appearance, will prove watery and insipid. A dry atmosphere produces effects, it is said, the reverse of these; the growth in this case is slower, the wood is of a more compact texture, and the fruit, when it arrives at maturity, attains a rich saccharine flavour.

The flavour of the fruit seems, therefore, it is thought, to depend, in a great measure, on the quantity of water daily evaporated from the leaves. Hence the superior strength of the wines made in the warm dry province of La Mancha, in Spain, when compared with those of Portugal. It is from this cause too, it is supposed, that vines growing on the sides of mountains, in the south of Europe, where they experience more ventilation, yield richer grapes, and make better wine, than when cultivated in the neighbouring valleys; though in the latter situation, they experience greater warmth, and the fruit arrives sooner at maturity. Many sorts of common fruit, capable of bearing the open air, on standard trees here too, have it of much better flavour, though of inferior size, than when trained to a wall, owing to the more perfect exposure of the leaves and fruit to the effects of light and ventilation. There is reason to suppose, it is thought, that the injury some varieties of grapes, habitants of warm dry countries, sustain in the hot-houses here, during a continuance of damp and cool cloudy weather, is owing to the accumulation of water in the vessels of the leaves and green fruit, as the writer has frequently remarked, that an increase of ventilation, during such a state of the atmosphere, will often prevent the injury, particularly if a little warmth be given at the time by the flues. Perhaps, instead of the deep rich composts in which vines are commonly planted, if a light soil, of from eighteen to twenty inches in depth, mixed with stones, or old mortar rubbish was used, the success would be better with the principal summer and autumnal crops of grapes. Vines planted in a soil of this sort will not, it is thought, grow with such exuberant vigour; and that as less water will pass into the plants through the absorbent vessels of the roots, the vines will probably receive less injury in moist cloudy weather, and the fruit will be better flavoured.

When vines are intended to be forced in the *winter* months, they require to be planted in a deep and rich compost, which should be well drained, for the surface of the soil is then so much chilled by frost, and melting snow, as to prevent the vigorous action of the roots.

The effects of ground heat too have been noticed in houses properly constructed for supplying it. In the early part of the month of February, the natural temperature of the soil, at the depth of thirty inches, is commonly, it is said, about 42° by the thermometer. If the heat of the ground be then raised to 45°, the vines in the course of two days begin to bleed; and when the temperature is gradually raised to 50°, the buds open with as much vigour, as when the forcing is commenced under ordinary circumstances at the latter end of March, when the natural warmth of the ground, owing to the increased excitability of the plant, is fully sufficient.

Forced grapes may be brought to a tolerable degree of perfection, it is said, at almost any season of the year, but in this climate they cannot attain their true flavour, unless they are ripened in the summer or autumn, when the temperature of the external air is such, as to admit of much ventilation, without danger of chilling the vines. It is said that experienced gardeners need not be informed of the necessity of keeping up a regular warmth during the time the vines are in flower, and till the fruit is set; it is, however, a common error, it is believed, which many fall into in the long days of summer, that of closing the lights of the hot-houses they manage too soon in the evening, and not opening them sufficiently early in the morning. In the writer's management, it is the practice, in general, to leave several of the upper lights open about *two* or *three* inches all night, from the beginning of July until the middle of October, which prevents that suffocating degree of closeness and musty smell, occasioned by the action of the light on the leaves and condensed water on the inner side of the glass. The flavour of the ripening fruit is greatly improved by allowing this stagnant vapour to escape, and the grapes may by this method be kept from rotting many weeks longer. It is said that in the hands of a judicious gardener, the hygrometer will be found as useful an appendage to the hot-house for grapes as the thermometer. A due degree of moisture during the night, in the *early* stage of the growth of the plant, accompanied at all times with *dry* warmth and ventilation in the *day* time, is a very essential matter to be attended to; as also the avoiding of all artificial moisture, by sprinkling the floor of the house, either in the day or night, in the latter stage when the fruit is ripening. See Vinery.

The same method of management is equally applicable and useful for several other sorts of fruit, such as those of the peach and fig kinds, and many others.

Besides these modes of cultivating vines, they are capable of being grown with advantages under hand-glasses, so as to produce

produce a few bunches on each plant. This method is now practiſed in many caſes, and found to be very eaſy and convenient.

The ſecond ſpecies requires artificial heat in this climate, and may be increaſed from ſeeds, obtained from abroad, which ſhould be ſown in ſmall pots, and be plunged into a hot-bed of tanner's-bark. When the plants come up and are fit to remove, they ſhould be each planted out into a ſeparate ſmall pot filled with light earth, and plunged into a freſh hot-bed, ſhading them from the ſun till they have taken new root; when they muſt be treated in the ſame way as other tender exotic plants, always continuing them in the ſtove, otherwiſe they will not ſucceed well.

The third ſhould be planted againſt a wall, and treated in the ſame way as the common vine, being raiſed by cuttings or layers in the ſame manner.

The fourth ſort is preſerved in ſome gardens for variety; but it rarely produces flowers in this climate, and has not much beauty. It is increaſed by laying down the young branches in the ſpring, which moſtly put out roots in one year fit to remove, when they may be taken off and planted out where they are to remain. Theſe require ſupport; and as their young branches are tender, and liable to be killed by froſt, they ſhould be planted againſt a wall, or pale, expoſed to the ſouth. The young ſhoots ſhould be ſhortened down to two or three buds in the ſpring, which will cauſe the ſhoots of the following ſummer to be much ſtronger.

VITIS *Idæa*, in *Botany*. See VACCINIUM.

VITISALTUS, a word uſed by ſome medical writers for St. Vitus's dance.

VITMANNIA, in *Botany*, ſo named by Vahl, in honour of the Rev. Fulgentius Vitman, profeſſor of Botany at Milan, author of a kind of *Species Plantarum*, entitled *Summa Plantarum*, in 6 vols. 8vo.—Vahl Symb. v. 3. 51. Willd. Sp. Pl. v. 2. 320. Mart. Mill. Dict. v. 4. (Samadera; Gærtn. t. 156.)—Claſs and order, *Octandria Monogynia*. Nat. Ord. akin to *Guttiferæ* of Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, ſhort, in four rounded concave lobes. *Cor.* Petals four, oblong, equal, obtuſe, fleſhy, rather concave, externally hoary; many times longer than the calyx. Nectary a ſmall obovate ſcale at the baſe of each filament, two oppoſite ones ſhorteſt. *Stam.* Filaments eight, thread-ſhaped, rather ſhorter than the petals, ſmooth; anthers linear, ſlightly cloven at the baſe. *Piſt.* Germen ſuperior, of four half-orbicular, compreſſed, ſlightly connected, lobes, three of which appear to be generally abortive; ſtyle central, awl-ſhaped, the length of the filaments; ſtigma acute. *Peric* none? *Seed.* Nut ſemilunar, compreſſed, of one cell, with a ſolitary obovate kernel.

Eſſ. Ch. Calyx four-cleft. Petals four. Nectary a ſcale at the baſe of each filament. Nut creſcent-ſhaped, compreſſed, with one ſeed.

1. V. *elliptica*. Oval-leaved Vitmannia. Vahl as above, t. 60. (Samandara; Herm. Zeyl. 5. Linn. Zeyl. 201.)—Native of Ceylon. A *tree*, with round, ſmooth, leafy *branches*. *Leaves* alternate, on ſhort ſtalks, elliptical, obtuſe, entire, coriaceous, ſmooth, with one rib, and many fine, tranſverſe, branched veins. *Stipulas* none. *Flowers* in long-ſtalked lateral umbels, about the ends of the branches. *Petals* not an inch in length. *Nut* various in ſize, from two to four inches long, ſharply two-edged, curved, at firſt deſcribed by Plukenet in his *Mantiſſa*, p. 12, as a ſort of bitter almond. He has miſſed other authors to cite Rheede's *Nagam*, Hort. Malab. v. 6. 37. t. 21, which is HERITIERA, a very different plant. See that article.

VITODURUM, in *Ancient Geography*, a town placed by the Itin. of Anton. between Vindomiſſa or Windiſch and Fines or Pfin, which, without doubt, was Wintertur.

VITOSCHA, in *Geography*, a mountain of European Turkey, in Bulgaria, on the borders of Romania, at the foot of which are ſome warm baths.

VITRAGO, in *Botany*, a ſpecies of plants, reſembling that of which the glaſs is made. It is otherwiſe called *helxine*.

VITRE', in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Ille and Vilaine; 19 miles E. of Rennes. N. lat. 48° 8'. W. long. 1° 9'.

VITREA TABULA, a name given by ſome authors to the internal table of the cranium.

VITRESCIBLE, or VITRIFIABLE, formed of *vitrum*, *glaſs*, is a denomination applied to all ſtones which, joined to alkaline ſalts, can form glaſs. In the laſt century, thoſe ſtones, which had before been called vitreſcible, were called ſiliceous by Mr. Pott, and after him by Mr. Cronſtedt. See STONE.

VITREUS HUMOR, or *Vitreous Humour*, in *Anatomy*. See EYE.

For the office of the vitreous humour, ſee VISION.

VITREY, in *Geography*, a town of France, in the department of the Upper Saône; 6 miles W. of Juſſey.

VITRIACO, PHILIPPUS DE, in *Biography*, is mentioned with great encomiums by early writers on counterpoint. We found a tract of his writing in the Vatican library, N° 5321, of which we obtained a copy. He is the reputed inventor of the minim, and a compoſer of motets, which have been very much celebrated by old muſical writers. His name very frequently occurs in ancient authors, particularly in England, where he has been commended both in verſe and proſe. "William Corniſh, chapelman to the moſt famoſe and noble kynge Henry VII., in a parable between Trouth and Informacion, publiſhed in Skelton's works, 12mo. 1736, names him among the greateſt muſicians upon record.

> "And the firſt principal, whoſe name was Tuballe,
> Guido, Boice, John de Muris, Vitryaco, and them al."

An anonymous Latin writer in the Cotton muſical manuſcript (Brit. Muſ.) ſays he invented the minim, and was a muſician univerſally approved and celebrated in his time. The author of the manuſcript in the Bodleian library, attributed to Thomas of Tewkeſbury, ſays the ſame. Morley, Ravenſcroft, and Butler, are of this opinion; and Morley tells us, that he uſed red notes in his motets to imply a change of mode, time, and prolation. Vitriaco, however, makes no mention of ſuch in his tract on counterpoint; and his motets, if they could now be found, ſuch is the tranſient ſtate of muſic, would be utterly unintelligible; though Morley tells us, that "they were for ſome time of all others beſt eſteemed and moſt uſed in the church." See MOTET.

VITRICIUM, in *Ancient Geography*, a town ſituated in the Alps, on the route from Italy into Germany, by the Graian Alps, between Eporedia and Auguſta Prætoria. Anton. Itin.

VITRIFICATION, or VITRIFACTION, the act of converting a body into glaſs, by means of fire.

Of all bodies, ſand, flints, and pebbles, with alkaline ſalts, vitrify the moſt eaſily: accordingly, it is of theſe that glaſs is principally made. See GLASS.

Gold held, by M. Homberg, near the focus of the duke of Orleans's large burning concave mirror, at firſt ſmoaked, then changed, all of it that did not go off in fumes, into glaſs of a deep violet colour. This glaſs of gold weighs leſs than gold. Memoirs of the Royal Academy, 1702.

All

All metals, and even almost all natural bodies, sufficiently heated, vitrify; and this vitrification is the last effect of the fire: after which, the most intense heat of the largest burning-glass will make no farther alteration.

VITRING, in *Geography*, a town of the duchy of Carinthia, with an abbey of Cistertians, on the Wordtsee; 4 miles S.W. of Clagenfurt.

VITRINGA, Campegius, in *Biography*, an eminent Dutch divine, was born at Leewarden in the year 1659, and educated first at Frankfort, and afterwards at Leyden, where he took his doctorial degree in 1679. In 1680 he was admitted to the ministry, and in the same year became professor of the Oriental languages at Franeker. In 1682 he was promoted to the chair of theology; and in 1693, to that of sacred history, in the same university. An apoplectic stroke terminated his life in 1722. He was the author of many learned works in theology and scriptural history; of which one of the most esteemed is his "Observationes Sacræ, Lib. VI." 4to. Francf. 1683, and two vols. 4to. 1712. But his most learned work is his "Commentary on Isaiah," in two vols. fol. Leeward. 1714–1720. Vitringa had two sons, *Horace* and *Campegius*, cut off at an early age. The former, who died at 18, published some animadversions on the work of Vorstius on the Hebraisms of the New Testament. The latter, who died in 1723 at the age of 31, was professor of theology at Franeker, and published several works, one of which was "A Summary of Natural Theology." After his decease was published a collection of "Several Dissertations" on criticism and theology. Moreri.

VITRIOL, Native, in *Mineralogy*, is a substance of greyish or yellowish-white, apple or verdigris-green, or sky-blue colour; and when decomposed, covered with an ochrey crust. It occurs in mass, disseminated, stalactical, and capillary. Externally it is rough and dull; internally it is more or less shining, with a vitreous or silky structure. Its fracture is generally fine and straight fibrous, sometimes also lamellar and conchoidal. It is soft, brittle, and translucent, and has an acerb metallic flavour. It is more or less soluble in water, and is a mixture in various proportions of the sulphate of iron, copper, and zinc. It is not unfrequently found in caverns and shafts, in argillaceous schistus, and in old mines, especially such as abound in blende and pyrites. Aikin.

Some take the word *vitriolum* to be used *quasi vitri oleum*, because of its shining colour; but Menage rather derives it *à vitreo colore*: the Latins call it *atramentum sutorium*; and the Greeks, *chalcanthus*.

It acquires different names, according to the different places where it is dug; and the vitriols of those also differ from each other in denomination and colour; some being *white*, others *blue*, and others *green*.

Roman and Cyprus vitriol, for instance, is blue; and that of Sweden and Germany, commonly called English vitriol, is green; besides which there is also a white kind, called Goslar vitriol.

Vitriol is very commonly called by the manufacturers copperas; accordingly, we constantly hear of green, blue, and white copperas. The constituent parts of the different kinds of vitriols were not understood by the ancients so well as they are at present: they seem to have had an idea, that copper was the basis of them all: hence the Greek term for vitriol, *chalcanthus*, the efflorescence of copper, and the Latin one, *cuperosa* or *cupri-rosa*, the flower or efflorescence of copper; from which, says Dr. Watson, the French *couperose*, and our copperas, are evidently derived. See Cabrusi.

Some moderns take the *chalcitis*, or *chalcanthum* of the ancients, which they supposed to be a native vitriol, that had acquired, according to their opinion, its full perfection in the entrails of the earth, and which is a kind of mineral stone, of a reddish colour, to be the same with that chalcanthum brought from Sweden and Germany; the best of which is of a brownish-red colour, and a vitriolic taste, and dissolves easily in water; and when broken, is of the colour of shining copper. See Vitriolic *Minerals*.

The vitriols which nature prepares are never to be met with in commerce; they serve to adorn the cabinets of the curious, but they are neither sufficiently pure for the purposes to which common vitriols are applied, nor are they found in sufficient quantities to answer the demand which is made for them.

Vitriol, in *Chemistry*, is a term that is now applied to every combination of the acid of sulphur with any metallic substance: three of these combinations, however, are more particularly distinguished, being of great use in various manufactures; *viz. green vitriol* or *sulphate of* Iron (which see), *blue vitriol* or *sulphate of copper* (see Copper and Copperas), and *white vitriol* or *sulphate of zinc*. (See Zinc.) The acid in all these vitriols is the same; the metallic basis of the green vitriol is iron, that of the blue vitriol is copper, and that of the white vitriol, zinc.

According to the analysis of sir Torbern Bergman, (Essays, by Cullen, vol. i. p. 180.) 100 parts of blue vitriol, or vitriolated copper, crystallized, contain 26 of copper, 46 of vitriolic or sulphuric acid, and 28 of water. According to Kirwan, 100 parts contain 30 of real acid, 27 of copper, and 43 of water. The taste is acescent, æruginous, and caustic; it calcines in heat; one part, in a moderate heat, requires nearly four parts of water, but much less of boiling water. Of white vitriol, or vitriolated zinc, 100 parts contain 20 of zinc, 40 of vitriolic acid, and 40 of water. According to Kirwan, 100 parts contain 22 of acid, 20 of zinc, and 58 of water. In a moderate heat, one part requires more than two of water, but much less of boiling water. Its taste is acescent, astringent, and caustic. Of green vitriol, or vitriolated iron, 100 parts contain 23 of iron, 39 of vitriolic acid, and 38 of water. According to Mr. Kirwan, 100 parts of it, recently crystallized, contain 20 of real acid, 25 of iron, and 55 of water. In moderate heat, one part requires six of water, but three-fourths of boiling water. In heat it splits into a yellow powder; in the fire, into a ferruginous powder. The taste is acescent, styptic, and caustic.

Green vitriol is often met with native in our coal-mines. From an old cannel coal-pit, near Wigan in Lancashire, Dr. Watson procured a considerable quantity of it, very well crystallized; and Dr. Rutty has observed, that the vitriolic water at Haigh, in Lancashire, is the strongest in Britain, yielding 1920 grains of vitriol from a gallon of water. See Vitriolic *Waters*.

The *green vitriol*, or sulphate of iron, commonly called English vitriol or copperas, and the Roman vitriol of the Italian writers, is prepared at Deptford, near London, and many other places, from martial pyrites, which is a native sulphuret of iron, and is found in abundance on Sheppey isle, the isle of Wight, and various other parts of the Essex, Kentish, Sussex, and Dorsetshire coasts. By exposing this to the air in large beds, oxygen is absorbed; the sulphur becomes sulphuric acid, and the new-formed salt is separated by washing, &c.

Much after the same manner vitriol is made from the pyrites found among coal: there are manufactories of it near Wigan, at Whitehaven, at Newcastle-upon-Tyne, and in several

ſeveral other parts of the kingdom. But all the vitriol works have ſunk in value of late years; the home conſumption of vitriol being much diminiſhed, ſince the acid, which uſed to be procured from the diſtillation of vitriol, has been obtained from the burning of ſulphur. For the ancient and modern method of obtaining this acid, we refer to the article SULPHURIC *Acid*.

It is not eaſy to determine when this method of making vitriol was introduced into England. In the beginning of the reign of queen Elizabeth, a patent was granted to Cornelius Devoz for making alum and copperas; but it was not till towards the end of the 17th century, that this art of making vitriol was brought to ſo great a perfection as to enable us to export any of it; and indeed Dr. Campbell (Surv. of Brit. vol. ii. p. 21.) aſſures us, that at the latter end of the 17th century we imported annually about five hundred tons of vitriol, and that we now export upwards of two thouſand tons. It appears from ſir Charles Whitworth's Regiſter of Trade, N° 1, that there were exported, from the port of London alone, near four hundred tons of copperas in three months, in 1776. A ſmall quantity of vitriol, perhaps to the annual amount of fifty or ſixty tons, ſays Dr. Watſon, is ſtill imported into England; ſome particular dyers, and other artiſts, being of opinion, that the foreign vitriol, as containing a little copper, is more uſeful to them than the Engliſh vitriol. It may be eaſily known whether green vitriol contains any copper, by only rubbing the vitriol to be examined upon a moiſtened piece of poliſhed iron; for if there is any copper in its compoſition, the iron will be changed into a copper colour.

Vitriol is alſo prepared from mineral waters that hold copper in ſolution, which is precipitated by iron: this ſolution of iron is afterwards cryſtallized, and always retains ſome copper. In Hungary it is prepared from pyritaceous ſchiſtus, and in many places from a ſpecies of calamine; the vitriol of Goſlar commonly contains a portion of zinc, as that of Hungary and Saxony does of copper; the Engliſh and French vitriols are purer, and yet ſometimes contain a ſmall proportion of alum. Turf and peat are ſometimes impregnated with vitriol; other earths alſo often contain vitriol and alum. This vitriol is ſometimes found of a white colour, on the borders of the mineral lakes of Tuſcany.

Pure vitriol of iron is conſiderably tranſparent, of a fine bright, though not very deep, graſs-green colour; of a nauſeous, aſtringent taſte, accompanied with a kind of ſweetiſhneſs. Diſſolved, and ſet to cryſtallize, it ſhoots into thick rhomboidal maſſes, a part generally riſing at the ſame time in efflореſcences about the ſides of the veſſel. The ſolution depoſits, in ſtanding, a conſiderable quantity, and in boiling a much larger one, of the metallic baſis of the vitriol, in form of a ruſty calx or ochre: iron ſeems to be the only metallic body that thus ſeparates ſpontaneouſly, in any conſiderable quantity, from the vitriolic acid. On expoſing the vitriol itſelf to a moiſt air, a ſimilar reſolution happens on its ſurface; which, ſooner or later, according as the acid is more or leſs ſaturated with the metal, changes its green to a ruſty hue. In a warm dry air, it loſes a part of the phlegm or water, neceſſary to its cryſtalline form, and falls by degrees into a white powder. Expoſed to a gentle fire, it liquefies and boils up; but ſoon changes, on the exhalation of the watery part that rendered it fluid, to a ſolid, opaque, whitiſh, or grey maſs: this pulverized, and urged with a ſtronger fire, continues to emit fumes, becomes yellow, being the *vitriolum calcinatum* of the London and Edinburgh Diſpenſatories; afterwards red, and at length turns to a deep purpliſh-red calx, called *colcothar of vitriol*, and the *chalcitis factitia* of the Paris Pharmacopœia, revivable by inflammable ſubſtances into iron. This colcothar was formerly ſold at Paris for ten-pence a pound, and uſed for giving the laſt poliſh to plate-glaſs, at the great manufactory in the ſtreet St. Antoine. The plate of glaſs, when firſt caſt, is an inch thick; its aſperities are ground away with a coarſe kind of grit-ſtone, with ſand and emery, of different degrees of fineneſs, and it is at laſt poliſhed by colcothar. Dr. Watſon ſuggeſted to the proprietors of the plate-glaſs manufactory, near Preſcot, in Lancaſhire, and to the patentees for poliſhing marble, at Aſhford, in Derbyſhire, that colcothar, which is very cheap, might perhaps render the uſe of putty, or calcined tin, leſs neceſſary. From the colcothar of vitriol is prepared the *ens veneris*.

From the green vitriol the vitriolic acid, now called ſulphuric acid, has been generally extracted; by diſtilling the calcined vitriol in earthen long necks, with a ſtrong fire continued for two days or longer; though it is now moſtly obtained by collecting the vapour of burning ſulphur.

The diſtilled ſpirit appears of a dark blackiſh colour, and contains a quantity of phlegm, greater or leſs, according as the vitriol has been leſs or more calcined. On committing it a ſecond time to diſtillation, in a glaſs retort placed in a ſand-heat, the phlegmatic parts riſe firſt, together with a portion of the acid, and are kept apart under the name of *ſpirit*, or *weak ſpirit of vitriol*, *ſpiritus vitrioli tenuis* of the London Diſpenſatory: at the ſame time, the remaining *ſtrong ſpirit*, or *oil*, as it is called, loſes its black colour, and becomes clear; in which ſtate it is the *acidum vitriolicum* of the Edinburgh Diſpenſatory, and the *ſpiritus vitrioli fortis* of that of London; and this is the uſual mark for diſcontinuing the rectification.

The College of Edinburgh now directs a weak vitriolic acid of more certain ſtrength, made by mixing one part of the ſtrong acid with ſeven parts of water: this is called *acidum vitriolicum tenue*, vulgò *ſpiritus vitrioli tenuis*. See SULPHURIC *Acid*.

Blue vitriol, or vitriol of copper, is commonly called Roman or Cyprian vitriol, or blue-ſtone. After being long expoſed to the air, it degenerates into a mixture of blue and ruſty yellow. It requires about four times its weight of water to diſſolve it in the temperature of 60°. Its ſpecific gravity is about 2.23. This ſalt rarely occurs cryſtallized, but is often found naturally diſſolved in water, in Hungary, Sweden, and Ireland; from which water blue vitriol is generally prepared, by evaporating the water to a proper ſtandard; after which it is let out into coolers, where it ſhoots into regular and beautiful cryſtals of a rhomboidal form. See ZIMENT *Water*.

It is alſo occaſionally extracted from ſulphurated copper ores after torrefaction, by the application of water, or waſhed out by rain or ſubterraneous waters. Mr. Cronſtedt ſays it is ſeldom free from iron and zinc. If a piece of clean poliſhed iron be dipped into the ſolution of this ſalt, it will almoſt immediately be covered with a cupreous coat: this, together with the deep blue colour ariſing from mixing it with a volatile alkali, diſcovers its baſis; as its uniform mixture with other vitriolic ſalts does its acid. Hence it alſo appears, that the acid of vitriol has a greater affinity with iron than with copper, becauſe it quits copper to unite itſelf with iron. This fact explains, in a very ſatisfactory manner, the nature of that tranſmutation of iron into copper, which was formerly conſidered as a perplexing phenomenon. Agricola ſpeaks of waters in the neighbourhood of Newſol, in Hungary, which had the property of tranſmuting the iron which was put into them into copper. In the year 1673, our countryman, Dr. Brown, viſited a famous copper-mine at Herrn-Grundt, near Newſol; and he informs us, that

that he there faw two fprings, called the old and new Ziment, which turned iron into copper. The iron in this cafe is taken up by the water, and remains fufpended in it, in the place of the copper: fo that this tranfmutation is nothing but a change of place; and as the copper is precipitated by the iron, fo the iron might be precipitated by pot-afh, or any other fubftance which has a greater affinity with the acid of vitriol than iron has.

The caufe of the impregnation of thefe copper waters in Germany is not difficult to be explained. Moft copper-ores contain fulphur, and when the fulphur is in any degree decompofed, its acid unites itfelf to the copper, and forms blue vitriol, which is the fubftance with which the waters iffuing from the copper-mines are impregnated. The copper contained in thefe waters has been for fome centuries collected in Germany, by putting old iron into pits filled with the coppery water; and thus the iron is diffolved, and the copper is precipitated, and being raked out in the form of mud, it is afterwards melted into very fine copper. The quantity of copper procured by an hundred tons of iron amounts fometimes to ninety tons, and feldom to lefs than eighty-four. Of late years fome fuccefsful attempts of this kind have been made in England and Ireland. See Copper.

In the Ifle of Anglefey, near Paris mountain, which abounds in copper ore, the water in which the roafted ore is wafhed is fo ftrongly impregnated with copper, that they have found it ufeful to adopt the German method of precipitating it by means of old iron, and they have obtained in one year near a hundred tons of copper, precipitated from this water. The water, after the copper has been precipitated by means of iron, is at prefent thrown away; whereas, by evaporation, it would yield green vitriol; and as above a hundred tons of iron muft be employed in obtaining the forementioned quantity of copper, Dr. Watfon fuggefts, whether a manufactory of green vitriol might not be eftablifhed at this and at all other places where copper is obtained by precipitation. One hundred tons of iron would yield, at the leaft, two hundred tons of vitriol, which, at the low price of 3*l. per* ton, would defray the expence of extracting it; more efpecially as the watery folution might be evaporated by a proper application of part of that heat, which is now loft in all the great fmelting houfes.

The greateft part of the blue vitriol, now met with in the fhops, is prepared in England, by artificially combining copper with its fulphur or its acid. The method of making the preparation by the glafs-makers is this: Take little thin pieces of brafs, and lay them ftratum fuper ftratum in a crucible, with powder of brimftone. When the veffel is full, fet it luted and covered in an open wind-furnace, with burning coals over it, and let it ftand two hours; then let the furnace cool of itfelf, and take out the crucible, the mafs within will be of an obfcure blackifh-purple; powder it and fift it fine, and then mixing with every pound of it fix ounces of powdered brimftone, take a round veffel of earth, that will bear the fire, place it upon iron bars fet acrofs in an open wind-furnace, fill it with coals, and then put in the powder; keep it burning and ftirring about till all the brimftone is burnt up; then take out the pan, and powder the calcined mafs again; fift it fine, and proceed with it thrice as before; the laft time let it ftand on the fire till it becomes red. Put a pound of this calcined copper into a glafs body, with fix pints of water; evaporate two pints or thereabout in a fand heat; the water is then of a fine blue, and muft be poured off clear; then filtrate it. Evaporate the water from the remaining fediment of copper left in the glafs, and with new fulphur calcine it again and again; repeat this five or fix times, and extract the blue tincture with water as before; filtrate all the waters, and put them together. Evaporate all to a fifth part, or thereabouts, and fet it in a cool place, and fine pointed cryftals will be formed, refembling emeralds; feparate thefe cryftals, and evaporate the water again, till all the cryftals be procured. Then put a pound of them into a glafs retort, well luted, and fitted to a capacious receiver; let the joints be well clofed, and make a moderate fire for four hours; then make it violent for twenty hours, or till no more white fumes arife. The next day open the receiver, and feparate the liquor into a glafs, where it muft be kept carefully fealed up. Neri's Art of Glafs, p. 50.

Very great things are to be done in the glafs art by means of this liquor; the remainder in the retort expofed to the air for a few days, will acquire a blue colour, and this, mixed with zaffer, will give glafs a fine fea-green. The vitriol of copper is of an elegant fapphire blue colour; hard, compact, and femitranfparent; when perfectly cryftallized, of a flattifh, rhomboidal decahedral figure; in tafte extremely naufeous, ftyptic, and acrid. Expofed to a gentle heat, it firft turns white, and then of a yellowifh-red or orange colour; on increafing the fire, it parts, difficultly, with its acid, and changes at length to a very dark red calx, reducible, by fufion with inflammable fluxes, into copper.

Some writers hold vitriol to be the root or matrix of copper; becaufe, in the copper-mines, they never dig deeper than the glebe, out of which the vitriol is drawn. For the ufe of blue vitriol in medicine, &c. fee Vitriol, in *Medicine*.

The *white vitriol*, or vitriol of zinc, is found native in the mines of Goflar, fometimes in tranfparent pieces, more commonly in white efflorefcences; which are diffolved in water, and cryftallized into large irregular maffes, fomewhat refembling fine fugar; it is alfo found diffolved in mineral waters, and generally with fome proportion to the vitriol of iron and copper: it is in tafte fweetifh, naufeous, and ftyptic.

It has been difputed, whether white vitriol is any thing elfe than green vitriol calcined. But it feems that white vitriol is of a quite different fpecies from either the green or the blue vitriols. Geoffroy, Mat. Med. tom. i. p. 124.

In the condition in which white vitriol is ufually bought, it contains fomewhat both of copper and iron; but being purified by folution, filtration, and cryftallization, it is freed from both thefe metals, and appears to be a native vitriol *fui generis*. See Cramer, Elem. Art. Docim. vol. i. p. 302. ed. 2. Med. Eff. Edinb. Abr. vol. ii. p. 472.

If four ounces of alum be put in concoction with two parts of cadmia foffilis pulverized, the earth of the alum precipitates, and its acid takes hold of the earth of zinc, fo that a true white vitriol is the refult.

This vitriol being precipitated by an alkaline ley, and dried, after its falts are feparated in water, and then mixed with charcoal-duft, will give zinc.

The fame thing happens in mixing vitriol of iron with two or three parts of lapis calaminaris; but the operation is eafier with alum and vitriol of copper. Marggraaf, in Mem. de l'Acad. de Berlin, 1746.

The white vitriol requires little more than twice its weight of water to diffolve it in the temperature of 60°; its fpecific gravity is about 2.000. It mixes uniformly with vitriolic neutral falts, but precipitates nitrous or marine felenites from their folutions, which afcertains its acid principle; it is itfelf precipitated whitifh by alkalies and earths, but not by iron, copper, or zinc, which fufficiently indicates its bafis: if it contains any other metallic principle, this may be precipitated

cipitated by adding more zinc, except iron, which will of itself precipitate by exposure to the air, or boiling in open air. That in common use is mostly prepared at Goslar, from an ore which contains zinc, copper, and lead, mineralized by sulphur and a little iron: the copper ore is first separated as much as possible, and the residuum, after torrefaction and distillation, is thrown red-hot into water, and lixiviated: it is never free from iron.

The common white vitriol of the shops contains a quantity of ferruginous matter; of which, in keeping, a part is extricated from the acid, in an ochrey form, so as to tinge the mass of a yellow hue. On dissolving the whitest pieces in water, a considerable portion of ochre immediately separates: the filtered solution, transparent and colourless, becomes again turbid, and yellow, on being made to boil, and deposits a fresh ochrey sediment; and a like separation happens, though much more slowly, on standing without heat. Hence, when the solution is evaporated to the usual pitch, and set to crystallize, the crystals generally prove foul; unless some fresh acid be added (as an ounce of the strong spirit or oil of vitriol to a pound of the salt) to keep the ferruginous matter dissolved: this addition secures the whiteness of the crystals, and prevents their becoming soon yellow in the air. White vitriol generally contains also a small portion of copper distinguishable by the cupreous stain which it communicates to polished iron immersed in solutions of it, or rubbed with it in a moist state. The quantity of copper is, indeed, very small, and may, if it be thought necessary, be separated by boiling the solution for some time, along with bright pieces of iron, which will extricate all the copper: by continued or repeated coction, the greatest part of the ferruginous matter may also be separated. For the use of white vitriol in medicine and surgery, see VITRIOL, in *Medicine*, infra.

VITRIOL, in *Medicine* and the *Arts*, has various applications and uses. *White vitriol* is sometimes given, from five or six grains to half a drachm and more, as an emetic, and appears to be one of the quickest in operation of those that can be employed with safety. Its chief use is for external purposes, as a cooling restringent and deficcative: a dilute solution of it, as sixteen grains in eight ounces of water, with the addition of sixteen drops of weak vitrolic acid, or the *aqua vitriolica* of the Edinburgh Dispensatory, is an excellent collyrium in defluxions and slight inflammations of the eyes; and, after bleeding and purging, in the more violent ones. A solution of it with alum, in the proportion of two drachms of each to a pint of water, called the *aqua aluminosa Bateana*, is used as a repellent fomentation for some cutaneous eruptions, for cleansing foul ulcers, and as an injection in the fluor albus and gonorrhœa, when not accompanied with virulence. This vitriol is sometimes likewise employed as an errhine, and said to be a very effectual dissolvent of mucous matters; in which intention it is recommended, in the German Ephemerides, against obstructions of the nostrils in new-born infants. See ZINC.

Blue vitriol, like the other preparations of copper, acts, in doses of a few grains, as a most virulent emetic. Its use is chiefly external, as a detergent, escharotic, and for restraining hæmorrhages; for which last intention a strong styptic liquor used to be prepared in the shops, and called *aqua vitriolica cærulea*. Blue vitriol has of late been considerably employed as an emetic by some practitioners; and is said to be by no means an unsafe one, as it operates the instant it reaches the stomach, before it has time to injure by its corrosive quality. The peculiar advantage in using it is represented to be, that it has no tendency to become also purgative, and that its astringent power prevents the tone of the stomach from being impaired after vomiting with it. It is much recommended in the early state of tubercles in the lungs; and the following method of exhibition directed. (See Simmons on the Treatment of Consumptions, p. 70.) Let the patient first swallow about half a pint of water, and immediately afterwards the vitriol, dissolved in a cupful of water. The dose may be varied according to age, constitution, &c. from two grains to ten, or even twenty; always taking care to begin with small ones. After the emetic is rejected, another half pint of water is to be drunk, which is likewise speedily thrown up, and this is commonly sufficient to remove the nausea. In still smaller doses, the blue vitriol has been much used by some as a tonic in intermittents, and other diseases. See COPPER and SULPHATE *of Copper*.

Pure green vitriol is in no respect different from the artificial SAL *Martis*; which see. It is one of the most certain of the chalybeate medicines, scarcely ever failing to take effect where the calces, and other indissoluble preparations, pass inactive through the intestinal tube. It may be conveniently given in a liquid form, largely diluted with aqueous fluids: two or three grains, or more, dissolved in a pint or quart of water, may be taken in a day, divided into different doses. This vitriol is used also, especially when calcined, as an external styptic: the styptic of Helvetius, and, as it is said, that of Eaton, is no other than French brandy impregnated with the calcined vitriol: a drachm of the vitriol is commonly directed to a quart of the spirit, but only a minute portion of the drachm dissolves in it. (See STYPTIC.) As French brandy has generally an astringent impregnation from the oaken casks in which it has been kept, the vitriol changes it, as it does the watery infusions of vegetable astringents, to a black colour; but makes no such change in spirituous liquors that have not received some astringent tincture. See IRON, SULPHATE *of Iron*, and TINCTURE.

The *acid of vitriol*, or sulphur (sulphuric acid), largely diluted, is the most salubrious of all the mineral acids. It is mixed with watery infusions, spirituous tinctures, and other liquids, as an antiphlogistic; as a restringent in hæmorrhages; and as a stomachic and corroborant in weaknesses, loss of appetite, and decays of constitutions, accompanied with slow febrile symptoms, brought on by irregularities, or succeeding the suppression of intermittents by Peruvian bark. In several cases of this kind, after bitters and aromatics of themselves had availed nothing, a mixture of them with the vitriolic acid has taken effect: the form commonly made use of is that of a spirituous tincture; six ounces of *oil of vitriol* are dropt by degrees into a quart of rectified spirit of wine; the mixture digested for three days in a very gentle heat, and afterwards digested for three days longer with an ounce and a half of cinnamon, and an ounce of ginger; this is the *elixir vitrioli* of the Edinburgh Dispensatory. Or, a pint of an aromatic tincture, drawn with proof spirit, is mixed with three ounces of the strong acid, so as to form the *acid elixir of vitriol* of the late London Dispensatory: these liquors are given from ten to thirty or forty drops, in any convenient vehicle, when the stomach is most empty. (See ELIXIR.) A mixture of oil of vitriol with spirits of wine alone, in the proportion of one part of the former to three of the latter, digested together for some time, has been used in France as a restringent in gonorrhœas, female fluors, and spittings of blood, under the denomination of *aqua Rabelliana*, and *eau de Rabel*. The acid of vitriol, diluted with water, has been given internally with great success in the itch. It was first used for this purpose in the Prussian army in 1756, and has since been much employed in several parts of Germany. The dose recommended is from an

an eighth to a fourth of a drachm of the pure acid twice or thrice a day. It is said to succeed equally in the dry and moist itch; and when given to nurses, to cure both themselves and their children.

When oil of vitriol, and rectified spirit of wine, are long digested together, or distilled, a part of the acid unites with the vinous spirit into a new compound, very volatile and inflammable, of no perceptible acidity, of a strong and very fragrant smell, and an aromatic kind of taste: this dulcified part, more volatile than the rest, separates and rises first in distillation, and may thus be collected by itself. The College of London directed this *spiritus vitrioli dulcis* to be made by cautiously and gradually mixing a pound of oil of vitriol, and a pint of rectified spirit of wine, and setting them to distil with a very gentle heat: that of Edinburgh ordered the same quantity of the oil of vitriol to be dropt into four times as much of the vinous spirit, and the mixture to be digested in a close vessel, for eight days, previously to the distillation, with a view of promoting the coalition of the two ingredients. The different proportions of the acid spirit to the vinous, in these prescriptions, make no material variation in the qualities of the product, provided the distillation be duly conducted; for the smallest of the above proportions of acid is much more than the vinous spirit can dulcify, and all the redundant acid remains in either case behind. The true dulcified spirit rises in thin subtile vapours, which condense upon the sides of the recipient in straight striæ; these are succeeded by white fumes, which form either irregular striæ, or large round drops like oil; at the first appearance of which, the process is either to be stopped, or the receiver changed. The spirit which these fumes afford, very different from the dulcified one, has a pungent acid smell, like the fumes of burning sulphur: on its surface is found a small quantity of oil, called the *sweet oil of vitriol* of Hoffman, of a strong, penetrating, and very agreeable smell, readily dissoluble in spirit of wine, to a large proportion of which it communicates the smell and taste of the aromatic or dulcified spirit. The College of Edinburgh, in order to secure against any acidity in the dulcified spirit, ordered it to be rectified, by mixing it with an equal measure of water, in every pint of which a drachm of salt of tartar has been dissolved, and drawing off the spirit again by a gentle heat. This College, in their last Pharmacopeia, have manifestly shewn how little they conceive the acid to enter as a constituent part of this preparation, and at the same time have directed an effectual method of preventing its presence in it. They order the *acidum vitriolicum vinosum*, vulgò *spiritus vitrioli dulcis*, to be made by simply mixing one part of vitriolic ether with two of rectified spirit. See *Sulphuric* ETHER, and SPIRIT *of Ether*.

This spirit, taken from ten to eighty or ninety drops, strengthens the stomach and digestive powers, relieves flatulencies, promotes urine, and, in many cases, abates spasmodic strictures, and procures rest. It is not essentially different from the celebrated mineral anodyne liquor of Hoffman; to which it is frequently, by the author himself, directed as a substitute. See LIQUOR *mineralis anodynus*, *Ethereal* SPIRIT, and *Compound* SPIRIT *of Ether*.

The dulcified spirit is sometimes used as a menstruum for certain resinous and bituminous bodies, which are more difficultly and languidly acted upon by pure vinous spirits. It is often mixed with aromatic and stomachic tinctures, in cases where the stomach is too weak to bear the acid elixirs above-mentioned: eight ounces are commonly added to a pint of the officinal aromatic tincture; or the ingredients of the aromatic tincture are infused in the dulcified acid, instead of common rectified spirit, in order to form the *sweet elixir of vitriol*. A medicine of this kind was formerly in great esteem, under the name of *Vigoni's volatile elixir of vitriol*, prepared by macerating, in some dulcified spirit of vitriol, free from acidity, a small quantity of mint-leaves carefully dried, till the spirit has acquired a fine green colour: and to prevent the necessity of filtration, during which the more volatile parts would exhale, the mint may be suspended in the spirit in a fine cloth. If the dulcified spirit, rectified from a solution of fixed alkaline salt, be shaken with equal its quantity of a like solution, and the mixture suffered to rest, an ethereal fluid rises to the surface, and great part of the dulcified spirit may be recovered again from the remainder by distillation. Dr. Hadley obtained the largest portion of ether, by using the strongest vitriolic acid of the shops with equal its quantity, by measure, of spirit of wine, and distilling immediately by a heat sufficient to make the mixture boil. By this management, from three pints of oil of vitriol, and six pints of rectified spirit of wine, he obtained two pints and a half of the ether.

The vitriolic acid saturates a larger quantity of fixed alkaline salts than any of the other acids, and dislodges from them such other acids as have been previously combined with them. Of the strong spirit, or oil of vitriol, about five parts are sufficient for eight of the common vegetable fixed alkalies. The neutral salt thus obtained is of a bitterish taste, very difficultly soluble in water, and scarcely fusible in the fire: in small doses, as a scruple, or half a drachm, it is an useful aperient: in larger ones, as four or five drachms, a mild cathartic. This salt has been commonly prepared with the alkali obtained from tartar, and hence called *vitriolated tartar*, and sometimes *sal enixum*, and *arcanum duplicatum*. Some dilute the oil of vitriol with six times the quantity of warm water, and drop into it a solution of the alkaline salt till no effervescence ensues: others use vitriol in substance, which being dissolved in boiling water, any alkaline salt, gradually superadded, till the effervescence ceases, absorbs the pure acid, and throws down the metallic basis of the vitriol: one part of the alkali is nearly sufficient for two of the vitriol.

With the mineral fixed alkali, this acid forms compound salts of a more bitter taste, somewhat less purgative, and much easier of solution, than that with vegetable alkalies: with volatile alkalies, a very pungent ammoniacal salt, whose medicinal effects are not well known. The strong acid, boiled on argillaceous earths to dryness, corrodes a portion of them, and concretes with them into an austere styptic salt. Calcareous earths it does not dissolve into a liquid state, but may be combined with them, by precipitation from other acids, into an indissoluble concrete, seemingly of no medicinal activity. Among metallic bodies, it dissolves zinc and iron readily; copper, silver, quicksilver, lead, and tin, very difficultly: it is fitted for acting on the two first by dilution with three or four times its quantity of water: the others require the undiluted acid, and a heat sufficient to make it boil; when, the more phlegmatic parts exhaling, so much of the pure acid matter remains combined with the metals as to render them, in part at least, dissoluble in water.

The principal use of green vitriol is in dyeing, and in the making of ink. When the vitriol is dissolved in water, the iron contained in it becomes black by the addition of an infusion of gall-nuts. Mr. Lemery, the younger, in order to account for this blackness, imagines, that as the vitriol, of which ink is made, is iron dissolved by an acid, and intimately mixed with it, and as galls are an alkali or absorbent, this alkali, meeting the acids which hold the iron dissolved, unites

unites with them, and makes them set the iron loose; which thereupon revivifies, and resumes its natural blackness: so that in strictness we write with the iron.

In the Swedish Transactions, vitriol is recommended as a yellow for house-painting: quicklime, made into a paste with water, is to be diluted with a solution of vitriol, more or less, according as the colour is required deeper or lighter: the mixture appears of a blueish-green colour, and does not become yellow till it is dry. One part of vitriol is said to go as far as two of the dearer yellow ochre. This salt is also recommended for preserving wood, as particularly the wheels of carriages, from decay: when all the pieces are fit to be joined together, they are directed to be boiled in a solution of vitriol for three or four hours, and then kept for some days in a warm place to dry. It is said that wood by this preparation becomes so hard and compact, that moisture cannot penetrate it. For the use of vitriol in agriculture, see SULPHATE *of Iron*. See on the subject of the preceding articles, Neumann's Chem. Works, by Lewis, p. 173, &c. Watson's Chem. Ess. vol. i. ess. 6. Lewis's Mat. Med. art. *Vitriolum*. Bergman's Ess. vol. i. p. 180, &c. Kirwan's Elem. of Mineral. p. 189, &c.

VITRIOLS, *Metallic*. All metals, it is to be observed, may be converted into vitriols, by dissolving them with acid spirits, and letting them stand to crystallize.

Factitious vitriols, being only metals dissolved and crystallized in saline menstruums, are frequently called, by way of distinction, *metallic vitriols*, and *metallic salts*.

VITRIOL *of Cobalt* is found native in small pieces, mixed with a greenish efflorescence, in cobalt mines: it is difficultly soluble in water; and both it and its solution are red, which sufficiently distinguishes its basis. Its acid is known by the same taste as that of the other vitriols.

VITRIOL *of Iron*, *Vitriolum Martis*, is a preparation made by dissolving iron, or steel, in oil or spirit of vitriol; then evaporating or drawing off the moisture, and bringing the matter to crystallize, by setting it in a cool place. This is also called *sal martis*, or *salt of steel*.

VITRIOL *of Lead*. See LEAD.

VITRIOL *of Luna*, or *the Moon*, is the name given to a salt with a metallic basis, called also *Vitriol of* SILVER; which see.

VITRIOL *of Nickel* is found native, efflorescing on kupfernickel, and generally mixed with vitriol of iron. This is difficultly soluble in water: both it and its solution are of a green colour. See NICKEL.

VITRIOL *of Quicksilver*, the name of a chemical preparation of quicksilver, with acid spirits, the process of which is this: let so rich a solution of quicksilver be made in spirit of nitre, or aqua fortis, that no more can be contained; let this solution be made by the assistance of heat, and the liquor immediately afterwards poured off into a clean and cold glass. There will, on this, spontaneously shoot on the bottom of the glass a saline, white, transparent matter, from which the liquor being poured, it is found to be a sharp, moist, saline substance, or true vitriol of mercury, soluble in water, and not safe to be touched. If the liquor, poured off from this, be evaporated half way, and the remainder set in a cool place, more crystals of the same nature with the first will shoot.

Another method of making the vitriol of mercury is this: reduce to powder some decrepitated sea-salt, and with two parts of this mix one part of crude mercury; distil the whole in a glass body, with a strong fire continued five or six hours; when the vessels are cold, break them, and there will be found a solid dry mercury, sublimed to the top and sides of the body, in form of vitriol. Nay, Boerhaave affirms, that the common mercury sublimate is a true vitriol of mercury, though semi-volatile. Boerh. Chem. part ii. p. 301.

Vitriol of quicksilver is also a name given to a salt of mercury, mineralized by vitriolic acid, first discovered by Mr. Woulfe, together with the marine salt of mercury, at Obermoschel, in the duchy of Deux-Ponts: they have a spar-like appearance, and are either bright and white, or yellow or black, mixed with cinnabar in a stony matrix: these well mixed with one-third of their weight of vegetable alkali, afforded him cubic and octagonal crystals, that is, salt of Sylvius, and tartar vitriol. Phil. Trans. vol. lxvi. part ii. p. 618.

VITRIOL *of Venus* is a solution of copper in spirit of nitre, evaporated and crystallized, to gain the salt; called also *vitriol of copper*.

VITRIOL, *Liquamen*, or *Wash of*, is a name given to the ochrey matter remaining after successive evaporations of the mother of vitriol, which yields no more vitriol. Its taste is acid and fiery, and the quantity left from a gallon of the well-impregnated liquor from the bed is about a pound. From this may be procured a white pungent salt, by subsequent evaporations. This is the saline principle of vitriol, according to the chemists, and is contained in so large a quantity, that nearly thirteen ounces of it may be separated from a pound of the liquor; the remaining liquor, after this, is what is called *liquamen vitrioli* by some chemists, but not properly. It will never coagulate into salt, but is very fiery and acrid to the taste, and extremely ponderous, not less so than oil of vitriol, nor less pungent; and is the strongest liquor any way obtained from a natural substance without distillation. This liquor being exposed to the air in a vessel not closed, will in a little time attract double its weight of water from it. All corrosive and saline liquors have somewhat of this property of imbibing moisture from the air, and weakening themselves by it; but this liquor attracts it faster and in greater quantity than any other. This liquor receives most moisture, and increases most quickly in wet weather, less so in dry; and this may have given occasion to that error so common among uninformed chemists, that several preparations of vitriol derive moisture from the moon, and have more or less of it, according to her different phases. The changes of the constitution of the air have effected what, in this case, they supposed to be done by the different phases of the moon. Phil. Trans. No. 103.

VITRIOL, *Mother of*. See VITRIOL, in *Chemistry*, supra.

VITRIOL, *Oil of*. See VITRIOLIC *Acid*, infra, and SULPHURIC *Acid*.

VITRIOLI, *Ros*. See ROS.

VITRIOL, *Saline Principle of*. See SALINE *Principle*.

VITRIOL, *Spirit of*. See SULPHURIC *Acid*.

VITRIOLATED, among *Chemists*, turned into vitriol, or having vitriol infused in it.

VITRIOLATED *Iron*. See SULPHATE *of Iron*, and IRON.

VITRIOLATED *Kali*. See SULPHATE *of Potash*.

VITRIOLATED *Magnesia*. See SULPHATE *of Magnesia*.

VITRIOLATED *Natron*. See SULPHATE *of Soda*.

VITRIOLATED *Tartar*. See TARTAR, *Vitriolated*.

VITRIOLATED *Zinc*. See *Sulphate of* ZINC.

VITRIOLIC, something that has the quality of vitriol, or that partakes of the nature of vitriol.

VITRIOLIC *Acid*. (See SULPHURIC *Acid*.) This acid, when first prepared by art, was distilled from dried sulphate of iron, or the common green vitriol, or copperas of commerce: it is still prepared in Saxony, and many other parts of

of Germany, from the same substance, in the manner described under SULPHURIC *Acid*. Accordingly, when the component parts neither of the salt nor of the acid were known, it was very naturally called "oil of vitriol;" acquiring this denomination probably from its resemblance to oil in adhering to the sides of a vessel containing it, and from its passing gently, or with little noise, from one vessel to another. However, as the name tends to give erroneous ideas of the nature of the acid, which is now known to be formed only of sulphur, oxygen, and water, it ought to be expunged. On account of the inconvenience and expence attending the method of procuring this acid from sulphate of iron, and the time required for the process, the manufacturers were led to the base itself, or the sulphur; which, in conjunction with nitre, was burnt in very large globes of glass, and the product was concentrated by boiling it in retorts or other glass vessels, till the fluid was of a sufficient strength for sale. See SULPHURIC *Acid*.

Mr. Parkes informs us (Chemical Essays, vol. ii.) that the process of forming sulphuric acid by the combustion of sulphur, was first adopted in this country by Dr. Ward, well known by his analeptic pill, white drop, and some other nostrums which bore his name. Fourcroy, however, attributes this important discovery to two French chemists, Lefevre and Lemery. Dr. Ward obtained a patent for his method of preparing it, and the article which he procured was denominated, by way of distinction, "oil of vitriol made by the bell." It is needless to describe his method, though it gave him for some time a monopoly of this British manufacture: until at length chambers of lead were employed for the combustion of the sulphur and nitre, so contrived that the floor of each might be constantly covered with a sheet of water, capable of absorbing the sulphuric acid gas at the time of its formation. The introduction of this leaden apparatus served to facilitate the manufacture of this acid, and in a short time reduced the price to about a quarter of its former rate. This important improvement is ascribed by Mr. Parkes to the late Dr. Roebuck, an eminent physician of Birmingham, who, in conjunction with his partner, the late Mr. Samuel Garbett, erected, notwithstanding a violent opposition on the part of Dr. Ward, the first leaden chamber for this purpose at Birmingham, about the year 1746: and the same works are now (1815), says Mr. Parkes, in the occupation of their successors, Messrs. Alston and Armitage. The consumption, however, was at first restricted, on account of local circumstances, to Birmingham and its vicinity. The manufacturers, therefore, with a view to a more extensive demand, and to the introduction of the article produced for the purpose of bleaching in the linen manufactories of Scotland and Ireland, established, on an extensive scale, in the year 1749, works at Preston-Pans, on the eastern coast of Scotland. It is observed, however, that Dr. Roebuck was not the *sole* founder of the works at Preston-Pans, or of the great iron-works at Carron. (See CARRON.) Of Dr. Roebuck, an account of whom has been by accident omitted under his name, it will be sufficient to observe, that he was a man of very superior talents, very considerable acquirements, and very amiable manners, highly esteemed at Birmingham, where he resided, and honoured with a peculiar intimacy with the celebrated Dr. Black. He died, much regretted, on the 17th of July, 1794. After this digression, we proceed to relate, that the doctor and his three brothers, together with Mr. Garbett, and Messrs. Cadell and Sons, of Cockenzie, near Preston-Pans, were the original projectors and founders of the vast works at Carron, to the great prejudice of their respective fortunes. This circumstance, together with an unfortunate concern in a colliery at Borrowstoness, brought ruin on all the doctor's fair prospects in life. With respect to the manufacture of sulphuric acid, we observe, that for several years Messrs. Roebuck and Garbett carried on their works in England and Scotland successfully and unopposed; and, besides supplying the demands of Great Britain and Ireland, exported very large quantities of sulphuric acid to the continent. At length, in the year 1756, their prospects were beclouded by the conduct of a servant, who had the art to induce a Mr. Rhodes, of Bridgenorth, to embark in the business. This person, abandoning Mr. Rhodes, connected himself with Mr. Skey, of Bewdley, who had commenced a manufactory of sulphuric acid on a much larger scale than that at Bridgenorth; and this was the third manufactory for producing the acid by the combustion of sulphur in leaden chambers. In the year 1772, a manufactory was established at Battersea, near London; and upon the failure of this, another manufactory was instituted at Pitsworth-Moor, near Eccles, in Lancashire. Soon afterwards another work was established at Leeds; and at length similar works have been founded in various parts of England, Scotland, and Ireland: and it is said, that there are now no fewer than eight considerable manufactories of sulphuric acid at and near Birmingham. When the new method of bleaching by oxymuriatic acid was introduced, about the year 1788, the demand for sulphuric acid was very considerably augmented, so that chambers for the combustion of sulphur of much larger extent than those first constructed became necessary. Chaptal, in his "Chemistry applied to the Arts," (vol. iii.) says, that chambers about 20 feet broad, 25 long, and 15 high, seem to be the most advantageous: and it is observed, that the size of the leaden chamber in modern use, is from 20 feet in length and 12 feet in width, to 40 or 60 feet long and 16 or 18 feet wide. One manufacturer in Lancashire, however, says Mr. Parkes, has a leaden chamber of the enormous dimensions of 120 by 40 feet, and 20 feet high, thus forming a space of 96,000 cubic feet. These leaden chambers are technically called "houses," and in some districts "leaden vessels." The sulphuric acid annually consumed in these kingdoms is said to amount to upwards of 3000 tons, the greater part of which is used in a state of dilution, in which state it is consumed in large quantities by bleachers, and by calico-printers, for making what they call "sours;" and also for the purpose of dissolving iron or zinc when diluted with at least five or six times its weight of water.

The uses of sulphuric acid are very numerous. It is employed in large quantities for preparing the bleaching salt; by dyers for dissolving indigo, and for other purposes; by calico-printers for preparing sours; and by the manufacturing and the philosophical chemist, as a test for lead and barytes, and for a great variety of other purposes, some of which only can be enumerated.

The makers of the nitrous and muriatic acids are large consumers of sulphuric acid; as also are the makers of sulphate of zinc, sal ammoniac, phosphate of soda, Glauber and other salts; as well as the manufacturers of Roman vitriol, Prussian blue, and some other colours.

Sulphuric acid is likewise employed by some modern farmers in the preparation of their seed-wheat, to prevent what is called the smut; by the people who purify lemon-juice, when united to lime, in order to separate its acid in a crystalline form for the use of calico-printers and others; and by the makers of glass to convert the muriate of potash, which is one of their residuums, into sulphate of potash, and which has lately been used by them as a substitute for soda.

soda. It is also consumed in large quantities by the makers of tin-plate, by brass-founders, button-makers, japanners and gilders; to all of whom this acid is become absolutely necessary for the removal of the oxyd which forms on the surface of the iron or the copper on which they work, and which, if not removed, would prevent or impede all their operations.

Sulphuric acid is likewise a necessary article to some paper-makers, to fell-mongers, and to tanners;—it is used in considerable quantities by the modern hatter in the operation of felting;—and it may be remarked that refiners use it in the process of stripping metals;—oil-merchants, in refining rape-oil, which it effects by carbonizing the farinaceous matter and the mucilage;—and brewers in fining what is called "gray beer:"—that the professors of pharmacy as well as the chemists are constant customers for sulphuric acid;—that it is employed in making the astringent and stomatic water of Rabel, and for other purposes of medicine, as well as surgery;—that distillers and rectifiers of ardent spirits consume it in still larger quantities;—that the makers of vinegar use it for the adulteration of that acid;—that many tons are annually consumed in the preparation of liquid blacking;—and that the aeronaut, at every ascension into the atmosphere, requires many hundred weights of sulphuric acid for the formation of the hydrogen gas, which renders the aerial machine buoyant in that subtile medium.

As the uses of sulphuric acid are become so various, cases may occur of its being taken into the stomach by mistake, and without immediate relief its corrosive properties would produce fatal effects. If magnesia should be at hand, that earth mixed with water and sweetened with sugar, would be the best possible antidote to the poison; but in case this could not be immediately procured, soap-water, which can be furnished by all families, and which is one of the next best remedies, should be drunk plentifully. Parkes, ubi supra.

For an account of the process of manufacturing this acid, and its properties, see the article SULPHURIC *Acid*. For tables, exhibiting the temperatures produced by the mixture of sulphuric acid and water, the specific gravities of the acid, when diluted with different portions of water, taken at the temperature of 60°; and of the variations in the specific gravity of concentrated sulphuric acid, by change of temperature, the barometer being at 29.5 inches, we refer to Parkes's Essays, vol. ii.

VITRIOLIC *Acid*, in *Agriculture*, is that which is now termed or known by the name of the sulphuric. It is noticed by the writer of the work on the Connection of Agriculture with Chemistry, that all acids are at present named from the peculiar bases or substances of which they are formed, by the combination of pure air or oxygen; the presence of which is necessary in all cases to constitute an acid. This is stated to be the most powerful of all the acids, and that it disengages or expels other acids, when in a state of combination with metallic, earthy, or alkaline substances in the soil or otherwise. When concentrated, it acts in a similar manner to that of alkaline salts, in the resolution or destruction of vegetable substances, as well as those of the animal kind, disengaging from them certain gases, and forming therewith certain saponaceous and saline compounds. These solutions or extracts are of a reddish-brown colour, similar to that produced by the action of alkaline salts on oxygenated peat or peaty earth. The vitriolic acid may, it is said, be used beneficially to decompose and bring into action the soluble matter accumulated in soils, by the combination of the phosphoric and sorcline or oxalic acids with calcareous matter. In this case, the vitriolic acid will join with the calcareous matter, and form gypsum or sulphate of lime; while the phosphoric and sorcline or oxalic acids, in consequence of their disengagement, will combine with other matters in the soil, particularly with magnesia, if any be present, forming saline matters which are very soluble, and conducive to vegetation and the growth of plants. The business is to be accomplished by the use of such substances as contain much of this sort of acid in cases where the other sorts of acids prevail.

It is suggested, however, that the endless series of processes employed by nature doth not finish or end here; for, on a supposition that the phosphoric and sorcline or oxalic acids had been fully disengaged from the calcareous matter with which they had been formerly united, and that in the states of phosphate and oxalate of potash, soda, ammonia, or magnesia, they had expended themselves in the process of vegetation; still the gypsum or sulphate of lime remaining in the soil would, on a renewed application of dung, urine, animal or vegetable matter, be brought from the state of gypsum or sulphate of lime, which is insoluble, to a state approaching to that of a hepar of lime, which is soluble; and that as the vitriolic acid and calcareous matter are contained in, and form a part of, the compounded residuum of vegetable matters, it may hence be inferred, that these matters were not generated in, but were taken up, when in a state of solution, by the roots of plants. Thus, it is said, may the good effects of gypsum or sulphate of lime in America be accounted for without much difficulty. And to these beneficial effects, from the combination of inflammable substances with gypsum or sulphate of lime, forming what is called a hepar, or liver of sulphur, may be added the large share of nourishment which trefoils, and plants of a certain formation of stem and leaf somewhat of that kind, receive by the hepatic air disengaged from the hepars, when they, by the process of oxygenation, are again returned to the state of neutral salts, of which such hepars had been formed by the combination of inflammable or carbonaceous matter. See OXYGENATION and SULPHATE *of Lime*.

VITRIOLIC *Minerals* are compound fossile substances, formed of various stony and earthy particles, mixed with others of iron and copper, and that either separately or conjunctly; so that, in effect, they are ores of vitriols.

The different kinds of these minerals are, 1. The chalcitis. 2. The misy. 3. Sory or rusma. 4. Melanteria. 5. Pyrites, or fire-stone. 6. Marcasites. See CHALCITIS, MISY, &c.

In Europe, the only use made of chalcitis is as an ingredient of Venice treacle, and even here its place is generally supplied with common green vitriol calcined to a redness. The ancient Greeks used it externally in hæmorrhages, and collyriums for the eyes; also for the herpes and erysipelas; but never ventured to give it internally.

The ancients used misy for the same purpose as chalcitis, being esteemed milder than this last.

At present it is no where put to any use, nor indeed does it merit it, as containing no other virtues than those of green vitriol, though we are not sure what pernicious substance it may be mixed with.

VITRIOLIC *Waters*. The countries which abound with mines of copper and iron usually afford a great many vitriolic waters. See *Blue Vitriol*, under VITRIOL.

One of the most remarkable springs of this kind, of which we have an account, is that near Paderborn, in Germany; this is a sort of treble spring, having three openings, and all three yielding very different waters. Two of these openings

openings are not more than a foot and a half diſtant from one another, and yet of ſo different qualities, that the one is limpid, blueiſh, milk-warm, and bubbling, and contains ſal ammoniac, ochre, iron, vitriol, alum, ſulphur, nitre, and orpiment; all theſe ſubſtances having been ſeparated in its analyſis. The other is cold as ice, and is turbid, whitiſh, and much heavier, and ſtronger to the taſte than the other. This holds much orpiment, with ſome ſalt, alum, nitre, ſal ammoniac, and vitriol. The firſt of theſe waters is taken by the people in the neighbourhood, againſt worms, and diſorders of the ſpleen, as alſo againſt epilepſies; the other is poiſonous to birds, all that drink of it dying in a very little time. The experiment has been tried on common hens, with the water brought from the ſprings into other places, and given them to drink.

Thoſe to which ſalt is given, after the ſwallowing of this poiſonous water, ſtruggle longer before they die by it; and vinegar is found to ſave them very often from death, after drinking largely of it; but in this caſe they are ſickly for ſeven or eight days after it, and have the pip, as the good women expreſs it.

In the diſſecting of thoſe birds which have died by drinking this water, the lungs are always found quite ſhrivelled up.

The people of the country have not been deterred by this bad effect of the water from uſing it in medicine; they take ſmall quantities of it diluted in water, to deſtroy the worms, and it performs this very well; but gives them a grievous ſickneſs while it operates.

The third ſtream, or opening, of this remarkable ſpring, is about twenty paces diſtant from the others; the water is here very clear, of a greeniſh colour, and of a ſour, but not very diſagreeable taſte. It is of a middle weight, and of middle qualities between the other two, and is evidently formed of the joining of thoſe two ſprings with ſome other freſh water in the way; for a liquor exactly reſembling this third kind may be prepared, by mixing equal quantities of the other two with a ſufficient quantity of common well-water.

There is a ſpring in Baſil diſcharging its water through the Tanners'-ſtreet, or Gerber-gaſſe, which is of a blueiſh colour, and ſomewhat turbid. This holds blue vitriol, that is copper, in the form of a ſalt, and with it bitumen and antimony; but a much larger proportion of the firſt ingredient than of either of the others. The analyſis of it ſhews, that it contains three parts copper to one of bitumen, and two of antimony. It ſerves the tanners of the place to good purpoſes, their ſkins receiving one of their preparations from this native water.

The ſame town affords ſeveral other ſprings of peculiar qualities, all owing to the veins of metalline ores with which the earth of the place abounds. The one of theſe is called Bandulph's well, and affords a water of great uſe in medicine, ſeveral being regularly and perfectly cured of hydropical diſtempers by it. And another very remarkable one contains, as is found by its analyſis, ſulphur, nitre, and ſome gold. Theſe, however, are in ſuch ſmall quantity in it, as not to prevent its being fit for the common uſes of life. It is very agreeable to the taſte, and is much eſteemed for drinking, and ſent for all over the town.

Another vitriolic water runs out of a cavern, near Gelſbach, in Alſace. It is a fattiſh and oily liquor, and is uſed by the country-people for greaſing their wheels, but it is fit for much better purpoſes. If it be boiled to the evaporation of a third part, there will remain very little water, but a fatty bituminous ſubſtance, like tar, will ſubſide to the bottom, and there will ſwim at the top a yellow, thin, and limpid liquor, very much reſembling linſeed-oil; and this, diſtilled in a ſand-heat, yields an oily and watery liquor; the firſt very good for external uſes, for burns and ſcalds; and the other a good internal medicine in conſumptions, and other diſeaſes of the lungs. Phil. Tranſ. N° 8.

Some time ago there was a water diſcovered in England, that gave, on many experiments, an appearance of containing natural and perfect vitriol. This water was found near Eglingham, in Cumberland; and being examined, by adding galls to it, it became abſolute ink, much deeper than any of the atramentous waters ever do; when one half the quantity was ſlowly evaporated, the remainder retained this quality to a higher degree than before; and on evaporating it yet farther, there concreted in it fair cryſtals of pure and genuine vitriol.

This was an appearance wholly new in England, and not eaſily accounted for, as we have no mineral, except the common pyrites, which contains vitriol; and it is very well known, that there requires a fermentation in the air, before the vitriol, contained in that ſtone, will be diſentangled from its other principles, ſo as to be capable of appearing in its own form; and as this ſtone, lying under water, can never impregnate that water with its vitriol, it did not ſeem eaſy to conceive in what manner a genuine vitriol ſhould be communicated to water, where there was no other ſubſtance which could give it. The ſuſpicions that theſe thoughts gave the gentleman who examined this water, occaſioned his making a viſit to the place where it was produced, when he found that the ſuppoſed vitriolic ſpring was no other than an old drift made for the draining of the water from ſome old wrought coal-pits; the people who had worked in theſe remembered to have ſeen great quantities of pyrites there. This drift was ſometimes dry for a conſiderable time together, and ſometimes ran in a plentiful ſtream; and there is no doubt but that, in theſe dry ſeaſons, the air acted upon the pyrites, and cauſed it to ſhoot its vitriol, which the next tide of water waſhed away, and it came off diſſolved in it, and highly impregnating it.

This proved, therefore, no better a medicinal ſpring than ſome of a like kind, deſcribed by Mr. Leigh in his "Natural Hiſtory of Lancaſhire;" and all theſe are very little better than the diſcovery of a medicated water in Old-ſtreet, from the remains of an old colour-ſhop, or Kircher's reckoning the common ſhores of Rome among the medicated ſprings of Italy.

The vitriolic ſpring which has been ſo much talked of near Haigh, in Lancaſhire, is no other than an accidental impregnation of common water, in the ſame manner: it being only the runnings of an old drift, or drain, made to carry off the water from the pits of cannel-coal; and this, like the other, as it ſometimes has water, and at other times is dry, gives time for the pyrites to let go its vitriol while dry, and then imparts it to the waters that paſs that way afterwards. Theſe are not to be accounted medicated ſprings, ſince neither natural nor continual, and ſuch may be any day made at home, by laying the common pyritæ of our clay, or coal-pits, out to moulder in the air, and then pouring water upon it, and, after a ſhort time ſtanding, taking it off again. Phil. Tranſ. N° 245. p. 380. See ZIMENT, and VITRIOL, in *Chemiſtry*.

VITRUM. See GLASS.

VITRUM, in *Botany*, a name given by ſome of the old writers to the plant we now call *glaſtum* or *woad*.

This plant has always been a native of England, and was in uſe among the ſavage inhabitants of this iſland, for painting their bodies. Thoſe who have not underſtood this to be the name of that plant, have been ſtrangely perplexed

to

to account for those people painting their bodies with *vitrum*, glass, as they understood it: but the whole meaning of this plant obtaining the name of vitrum, seems to have been its staining the skin to a pale blue colour, or, as it was called by many, a glass-colour.

VITRUM *Antimonii Ceratum*, in *Pharmacy*. See ANTIMONY.

This is an insipid, inodorous powder, of a brownish colour: in its operation diaphoretic and cathartic, occasionally exciting nausea and vomiting.

The ordinary dose for adults is ten or twelve grains; but it is sufficient to begin with six, or even with three or four grains. The quantity of a scruple has been given to a strong man, which wrought gently. The dose for a child of three or four years is two or three grains; and for one of ten, three or four grains.

This medicine was for some time held a specific in dysenteries; but the preparation and manner of giving it had been kept a secret, till Dr. Young made it public. Dr. (afterwards sir John) Pringle says, he tried it in a dysentery of four years standing with surprising success; and, indeed, to him we are principally indebted for the general introduction and use of this medicine; as he collected and published several cases of its efficacy.

It has been given in dysenteries, with or without a fever, whether epidemic or otherwise, and whether bleeding and vomits have been premised or not. In its operation, it sometimes makes the patient sick, and vomits him; it purges almost every person; but it has been known to cure without any evacuation or sickness. It is to be given with an empty stomach, for then it operates most mildly. Nothing is to be drank after it for three hours, unless the patient is very sick, and disposed to vomit; in which case warm water may be given, as in other vomits.

This medicine should not be given for diarrhœas in the end of consumptions. Other diarrhœas have been cured with large doses of it; but in such cases it fails oftener than in dysenteries. During the use of this powder, fermented liquors should be abstained from, and a milk diet is proper. It may be given safely to women with child, and to children on the breast may be given half a grain. This preparation has also been found successful in uterine hæmorrhages, both in young and old.

It has also been tried in colic pains, from viscidities in the intestines, and found a safe and easy purgative, and sometimes a gentle emetic.

The method of giving it is in a bolus, with conserve of roses, diascordium, or theriaca Edinensis. An opiate, after the operation, is proper. (Med. Ess. Edinb. vol. v. art. 15. p. 162, &c.) See an account of its efficacy in bloody fluxes, diarrhœas, simple loosenesses, quartan agues, even the most obstinate, and in certain cases of the fluor albus, and observations on the mode of administering it, by M. Geoffroy, in Phil. Trans. vol. lxvii. p. 273, &c.

Later experience, it is said, has proved that it possesses no advantages superior to other antimonials, properly dosed and combined, in the diseases above-mentioned; and differs from the vitrum antimonii, or glass of antimony, only in its milder operation, owing to part of the oxygen being abstracted by the carbonaceous matter of the wax, which appears to answer no other purpose. Thomson's Disp.

VITRUM *Archimedeum*, *Archimedes's Glass*, a name given by Swedenborg to an instrument which he invented for the examination of mixed metals, and by means of which he could discover the quantities, without the trouble of the apparatus and calculation commonly used for this purpose.

VITRUM *Morrhinum*, *Morrhine*, or *Myrrhine Glass*, a name given by Pliny, and some of the ancients, to a sort of manufacture made in Egypt, which, though truly no other than a kind of glass divested of its transparency, yet was made so nicely to imitate the *myrra* or *morra* of the Indies, so famous among the Romans, under the form of cups and vessels, called *murrhina vasa*, that it was called by some *murrha altera*, another sort of *murrha*, and the cups made of it honoured with the name of *murrhine vessels*. This serves to shew, that the *myrrhina vasa*, properly so called, were not of any precious stone, as vulgarly supposed, but a sort of porcelain. See MURRHINE.

VITRUM *Saturni*. See GLASS *of Lead*.

VITRUVIUS, M. POLLIO, in *Biography*, a very distinguished writer on architecture, is supposed to have flourished in the times of Julius Cæsar and Augustus: of his parentage and place of nativity nothing certain is known. Verona claims him; but the pretensions of Formia, now Mola de Gæta, are more generally allowed. Of his liberal education, and of his travels for information and improvement, we can have no doubt. By the exercise of his profession he had acquired some property; though perhaps it was not very considerable, as he says of himself that he did not, like the generality of architects, solicit employment. Under the emperor Augustus, or perhaps one of the succeeding princes, to whom he dedicated his work, he occupied the post of inspector of the military engines. But as Pliny the Elder mentions his name, among other authors, in his "Natural History," composed in the reign of Vespasian, his work must have been published before that period. Of edifices planned or constructed by him, one only is mentioned by himself, which was a Basilica at Fano. His work was discovered in MS. by Poggio in the 15th century, and it has ever since been held in high estimation. The ten books into which it is distributed, not only treat on every thing belonging to buildings, public and private, their scite, materials, forms, ornaments, conveniences, and the like; but include much of what would now be termed engineering, civil and military, and even digress to geometrical problems and astronomical inventions. Besides the instruction that may be derived from it, it has afforded much important matter to the antiquary relative to the state of art and science, and the detail of private life, among the Romans.

Some of the most esteemed editions of Vitruvius are "Dan. Barbari," Venet. fol. 1567; "J. de Laet," Amst. fol. 1649; "Galiani," Neap. fol. 1758; with an Italian translation and notes. "Claude Perrault" has given a good French translation, Paris, fol. 1684; and we have an English one by "Mr. Newton," Lond. 1791. Gen. Biog.

A magnificent edition of the Civil Architecture of Vitruvius, in two parts, royal folio, has been lately presented to the public by W. Wilkins, jun. A.M., F.R.S., &c. &c.

During the reign of Augustus, except Vitruvius, it does not appear that the Romans had one architect, sculptor, painter, or musician. Vitruvius has given Aristoxenus's system in Latin; but was obliged to retain the Greek technica, as he was the first Roman writer on the subject of music, and used Greek technical terms as we do Italian. Vitruvius has described the theatrical *vases* used by the Greeks for the augmentation and continuation of sound (see ECHEIA); and has given us a description of the organ of the ancients blown by the fall of water. See ORGAN and HYDRAULICON.

VITRY, JAMES DE. See JAMES DE VITRY.

VITRY, in *Geography*, a town of France, in the department of the Straits of Calais; 9 miles N.E. of Arras.—Also, a town of France, in the department of Paris; 4 miles S.S.E. of Paris.

VITRY *le Brulé*, a town of France, in the department of the

the Marne. This town was, in the 12th century, one of the principal places of the country, when Thibaut, count of Chartres, who took arms against Louis the Young, took it by assault, and set it on fire, by which many persons were burned, and great part of the town destroyed. It was on this account called *Brulé*. The English and Burgundians in the war with Charles VII. set fire to Vitry, with sixty villages, in the year 1422. It was a third time burned and ruined by the troops of the emperor Charles V.; 3 miles N.E. of Vitry le François.

VITRY *le François*, a town of France, and principal place of a district, in the department of the Marne, on the Marne; built by Francis I. after the destruction of Vitry le Brulé by the emperor Charles V.; 16 miles S.E. of Châlons-sur-Marne. N. lat. 48° 43′. E. long. 4° 38′.

VITRY *aux Loges*, a town of France, in the department of the Loiret; 18 miles N.E. of Orleans.

VITTA, among the Romans, a fillet with which the women in Rome bound their hair. The matrons wore a double one, to distinguish them from the virgins, whose vittæ were single.

Vittæ were also worn by priests and poets, in which case they were made of branches of olive or laurel: the statues of the gods were likewise adorned with the vittæ, as were altars, the doors of temples, victims, and supplicants.

VITTA, among *Anatomists*, *fillet*, or *head-band*, is used for that part of the amnios which sticks to the infant's head when it is just born.

VITTA *Cerulea*, in *Conchology*, a species of dolium.

VITTA, in *Ichthyology*, a name given by Gaza and some others, to the fish called by others *tænia*, and by the Italians *cepole*.

VITTARIA, in *Botany*, so called by the writer of this article, from *vitta*, a fillet, or ribband, in allusion to the shape of the frond.—Sm. Mem. de l'Acad. de Turin, v. 5. 413. t. 9. f. 5. Tracts, 243. t. 1. f. 5. Willd. Sp. Pl. v. 5. 404. Swartz Syn. Fil. 109. Nov. Act. Soc. Nat. Scrut. Berol. v. 2. 129. Sprengel Crypt. Engl. ed. 77, 114. Brown Prodr. Nov. Holl. v. 1. 153. Ait. Hort. Kew. v. 5. 522.—Class and order, *Cryptogamia Filices*; sect. *annulatæ*. Nat. Ord. *Filices dorsiferæ*.

Eff. Ch. Fructification in longitudinal continued lines, parallel to the midrib at each side. Involucrum double, uninterrupted; one separating towards the margin, the other towards the rib.

This genus was at first supposed by its author to consist of a solitary species, *Pteris lineata* of Linnæus; but Swartz and Willdenow have added several others, from their own discoveries or those of Bory de St. Vincent, so that eight in all are now known. Of these, Willdenow has given the most complete view. They are all of tropical origin. The *frond* is uniformly simple and entire, of a long nearly linear form, and either erect or pendulous; its texture generally coriaceous.

1. V. *lineata*. Linear Tape-fern. Swartz Syn. n. 1. Willd. n. 1. Schkuhr Crypt. 93. t. 101, b. (V. angustifrons; Michaux Boreal-Amer. v. 2. 261. Pteris lineata; Linn. Sp. Pl. 1530. Lingua cervina longissimis et angustissimis foliis; Plum. Amer. 28. t. 41. Fil. 123. t. 143; copied in Petiv. Fil. t. 14. f. 3.)—Fronds linear, very long. Lines solitary, a little within the margin.—Native of many parts of the West Indies. The perennial *root* consists of numerous reddish fibres, intermixed with scales. *Fronds* several, about two or three feet long, and a quarter of an inch wide, acute, coriaceous, smooth, of a bright green. We find no authority for Swartz's character of "pendulous" in the specific definition, except he alludes to the reflexed posture of the upper half of each frond in Plumier's figure, which seems contrived merely to admit the whole plant into the plate.

2. V. *isoetifolia*. Quillwort Tape-fern. "Bory de St. Vincent Voy. v. 2. 325." Swartz Syn. n. 2. Willd. n. 2.—Fronds linear-threadshaped, acute, pendulous, very straight; channelled at the top. Lines solitary, marginal.—Native of the isle of Bourbon, hanging from the trunks of aged trees. *Stalks* very scaly. *Fronds* rigid, from ten to eighteen inches long. *Involucrum* narrow. *Capsules* pale. *Willdenow*.

3. V. *filiformis*. Thread-shaped Tape-fern. Cavan. Leccion. 270. Swartz Syn. n. 3. Willd. n. 3.—Fronds thread-shaped, very long, glaucous.—Native of Peru. *Fronds* numerous, two or three feet in length, and half a line only in breadth. *Cavanilles*.

4. V. *elongata*. Long-leaved Tape-fern. Swartz Syn. n. 4. 302. Willd. n. 4. Brown n. 1.—Fronds linear, very long, coriaceous, ribless, pendulous. Lines marginal.—Native of the East Indies, and the tropical part of New Holland. *Roots* creeping, rigid, with downy rusty fibres. *Stalks* covered with black, shining, reticulated, hair-pointed scales. *Frond* three or four feet long, two lines broad, flat, rather rigid, smooth, minutely veined. *Swartz*.

5. V. *zosterifolia*. Grass-wrack Tape-fern. Willd. n. 5. ("V. angustifrons; Bory de St. Vincent Voy. v. 1. 238, and v. 2. 324.")—Fronds linear, very long, membranous, pendulous. Lines solitary, marginal.—Found on old trees, in the isle of Bourbon. *Root* creeping, scaly. *Fronds* five feet long, three or four lines broad, thin; tapering much at the base. *Lines* very narrow, close to the edges. The plant much resembles a *Zostera*. *Willdenow*.

6. V. *ensiformis*. Sword-shaped Tape-fern. Swartz Syn. n. 5. Nov. Ac. Berol. n. 3. t. 7. f. 1. "Schukhr Crypt. 94. t. 101, b." (V. incurvata; Cavan. Leccion. 270.)—Fronds linear-swordshaped, somewhat falcate, erect. Lines solitary, marginal.—Native of the Philippine isles, the Mauritius, and the East Indies. The *root* resembles that of *V. lineata*. *Fronds* numerous, six or eight inches high, and two lines broad, curved. *Cavanilles*.

7. V. *plantaginea*. Plantain-leaved Tape-fern. "Bory de St. Vincent Voy. v. 2. 325." Willd. n. 7.—Fronds linear-lanceolate, erect. Lines solitary, marginal, in the middle part of the frond.—Native of the isle of Bourbon. *Root* tufted, clothed with blackish, tapering, most elegantly reticulated scales. *Fronds* from ten to eighteen inches high, from three to five lines broad, tapering much at each extremity. *Lines* of fructification thickish, pale brown, but four or five inches long. *Willdenow*.

8. V. *lanceolata*. Lanceolate Aggregate Tape-fern. Swartz Syn. n. 6. Nov. Act. Berol. n. 2. t. 7. f. 2. Ind. Occ. 1603. "Schkuhr Crypt. 94. t. 101, b." (Hemionitis lineata; Swartz Prodr. 129.)—Fronds lanceolate-linear, erect. Lines numerous.—Found on old trees, on the mountains of Jamaica. *Root* fibrous, tufted, rusty, covered with shining reticulated scales. *Fronds* crowded, a foot high, acute, smooth, on short bordered *stalks*. *Lines* two, three, or four on each side of the rib, between it and the margin, reaching from top to bottom, each furnished with its double *involucrum*, though very narrow. *Swartz*.

VITTEAUX, in *Geography*, a town of France, in the department of the Côte d'Or; 9 miles S.E. of Semur en Auxois.

VITTEFLEUR, a town of France, in the department of the Lower Seine; 20 miles N. of Caudebec.

VITTEL, a town of France, in the department of the Vosges; 9 miles S.W. of Mirecourt.

VITTORIA, LODOVICO, in *Biography*, author of the most

moſt pompous publication of motets which we have ſeen. The parts are printed ſeparate on the oppoſite pages, and without bars, in ſuch large characters, that the performers of the ſeveral parts might ſing out of the ſame choral book. The following is the Latin title of this work: "Thomæ Ludovici Victoria Abulenſis Motecta Feſtorum totius Anni, cum Communi Sanctorum, *a* 4, 5, 6, 8 Vocibus." Romæ, 1585.

VITTORIA, in *Geography*, a town of Spain, in the province of Alava. This town was built by Don Sancho, king of Navarre, in memory of a victory obtained over the Moors on the ſpot. It contains five pariſhes, four convents, three hoſpitals, and a college. The inhabitants carry on a conſiderable traffic in wool and wine; but the principal article of commerce is in ſword-blades, of which they manufacture a great number; 42 miles S.S.W. of St. Sebaſtian. N. lat. 42° 47′. W. long. 2° 41′.

VITTORIA, *La*, a town of Sicily, in the valley of Noto; 20 miles N.W. of Modica. N. lat. 36° 55′. E. long. 14° 38′.

VITTORIOSA, or *Citta Vittorioſa*, or *Il Borgo*, a fortified town of the iſland of Malta, ſituated on a narrow neck of land, to the left of Valetta; on each ſide a broad natural canal runs up into the land, and ſurrounding the town, forms a fine harbour. This canal is on one ſide called Porto della Renella, and on the other Porto delle Galere. The ſtrong caſtle of St. Angelo ſtands on a high rock, and has a communication with the town by a bridge. The number of inhabitants amounts to 3000; formerly the grand maſter reſided here. The palace of the inquiſition and the arſenal are reckoned among the principal buildings of this place.

VITULI AQUATICI, in the *Hiſtory of Inſects*, a name given by the German writers to the worms reſembling animated horſe-hairs. See AMPHISBÆNA *Aquatica*.

VITULUS, CALF, in *Zoology*. See CALF.

VITULUS *Marinus*, the *Sea-calf*. See SEA-*Calf*.

VITUS'S DANCE, *St.*, in *Medicine*. See CHOREA.

VIU, in *Geography*, a town of France, in the department of the Po, on the Stura; 14 miles N.W. of Turin.

VIVA, or VIUA, in *Ancient Geography*, a town of Africa Propria, on the route from Carthage to Sufetula, between Carthage and Pulput. Anton. Itin.

VIVA *Pecunia* was anciently uſed for live cattle.

VIVA *Voce*, *q. d.* by word of mouth. See ORAL.

VIVACE, Ital. in *Muſic*, implies lively, gay, animated; not rapid, but an execution free and firm. See VIF.

VIVACITY *of Style*, in *Oratory*, a character of ſtyle, depending on the choice of words, their number, and their arrangement.

This quality of ſtyle is adapted to pleaſe the imagination, and conſequently to awaken and fix the attention. With regard to words, they may be conſidered in three points of view; as proper terms, or rhetorical tropes, or as to the relation which the ſound may be made to bear to the ſenſe. The chief importance and uſe of proper terms in their reference to the end propoſed is their "ſpeciality," or their being as particular and determinate in their ſignification as will ſuit the nature and ſcope of the diſcourſe. To this purpoſe it is obſerved, that in compoſition, particularly of the deſcriptive kind, it invariably ſucceeds beſt for brightening the image, to advance from general expreſſions to more ſpecial, and thence again to more particular. This, in the language of philoſophy, is called deſcending; but in the language of oratory, it is aſcending. With regard to the uſe of *tropes*, we refer to that article. Words may farther be conſidered with regard to their ſound, and the affinity to the ſubject of which the ſound is ſuſceptible. When, as Pope expreſſes it, "ſound is made an echo to the ſenſe," there is added, in a certain degree, to the aſſociation ariſing from cuſtom, the influence of reſemblance between the ſigns and the things ſignified; and this, without doubt, tends to ſtrengthen the impreſſion made by the diſcourſe. In this connection it is natural to enquire, what kinds of things language is capable of imitating by its ſound, and in what degree? In reply we may obſerve, that the imitative power of language muſt be greateſt, when the ſubjects themſelves are things audible. When the ſubject is articulate ſound, the ſpeaker or the writer may do more than produce a reſemblance; for he may even render the expreſſion an example of that which he affirms. Thus Pope affords an inſtance.

"Theſe equal ſyllables alone require,
Tho' oft the *e*ar the *o*pen vowels tire;
While expletives their feeble aid *do* join,
And ten low words oft creep in one dull line."

As to ſounds inarticulate, the ſame author has tolerably ſucceeded in imitating them.

"Soft is the ſtrain when Zephyr gently blows,
And the ſmooth ſtream in ſmoother numbers flows;
But when loud ſurges laſh the ſounding ſhore,
The hoarſe rough verſe ſhould like the torrent roar."

The ſame conformity of the ſound to the ſenſe is *too* diſcernible in the following lines.

"O'er all the dreary coaſts!
Dreadful gleams,
Diſmal ſcreams,
Fires that glow,
Shrieks of woe,
Sullen moans,
Hollow groans,
And cries of injur'd ghoſts."

Nor can we here overlook Milton's deſcription of the opening of hell-gates;—

"——— On a ſudden open fly,
With impetuous recoil and jarring ſound,
Th' infernal doors, and on their hinges grate
Harſh thunder—"

The following is alſo an excellent ſpecimen from the ſame author's "Lycidas:"—

"Grate on their ſcrannel pipes of wretched ſtraw."

Dyer has alſo made an excellent attempt in the ſame way, in his "Ruins of Rome:"

"——— The pilgrim oft
At dead of night mid his oraiſon hears
Aghaſt the voice of time, diſparting towers,
Tumbling all precipitate down-daſh'd,
Rattling around, loud thundering to the moon."

But the following lines of Pope furniſh the beſt example of this kind:

"What! like ſir Richard, rumbling, rough and fierce,
With arms, and George, and Brunſwick crowd the verſe,
Rend with tremendous ſounds your ears aſunder,
With gun, drum, trumpet, blunderbuſs, and thunder?
Then all your Muſe's ſofter art diſplay,
Let Carolina ſmoothe the tuneful lay,
Lull with Amelia's liquid name the nine,
And ſweetly flow through all the royal line."

There are other ſubjects beſide ſound, to which language is

is capable of bearing ſome reſemblance. Time and motion, *e. g.* or whatever can admit the epithets of quick and ſlow, may in ſome degree be imitated by ſpeech. This appears with particular advantage in verſe, when, without any violation of the rules of proſody, a greater or a leſs number of ſyllables is made to ſuit the time. Thus Milton :—

"When the merry bells ring round,
And the jocund rebecs ſound,
Tŏ mānȳ ă yōuth ănd mānȳ ă māid
Dancing in the chequer'd ſhade."

The Greek and Latin have here an advantage, at leaſt in their heroic meaſure, superior to all modern tongues ; accordingly Homer and Virgil furniſh excellent ſpecimens in this way. Our own tongue and metre, however, afford inſtances not unworthy of notice. We ſhall ſelect the tranſlation by our Engliſh bard of the following much admired paſſage from Homer :

"——— Λααν ανω ωθεσκε ποτι λοφον—
Αυτις επειτα πεδονδε κυλινδετο λαας αναιδης." Od.

"Up the high hill he heaves a huge round ſtone ;
The huge round ſtone reſulting with a bound,
Thunders impetuous down, and ſmokes along the ground."

Vida, in his "Art of Poetry," has well exemplified this beauty from his great maſter, Virgil :

"Ille autem membris, ac mole ignavius ingens
Incedit tardo molimine ſubſidendo."

Slowneſs of motion is admirably exemplified by Pope, in the following lines :

"A needleſs Alexandrine ends the ſong,
That, like a wounded ſnake, drags its ſlow length along."

In repreſenting uncommon ſpeed, he thus expreſſes himſelf :

"Not ſo when ſwift Camilla ſcours the plain,
Flies o'er th' unbending corn, and ſkims along the main."

Thus Dryden :

"Which urg'd, and labour'd, and forc'd up with pain,
Recoils, and rolls impetuous down, and ſmokes along the plain."

There are alſo other affections of motion beſides ſwiftneſs and ſlowneſs, which may, to a certain degree, be imitated in the ſound of the deſcription : but our limits will not allow us to introduce examples. Size or magnitude, difficulty and eaſe, are ſubjects of imitation in language. For an inſtance of difficulty, we produce the following couplet from Pope :

"When Ajax ſtrives ſome rock's vaſt weight to throw,
The line too labours, and the words move ſlow."

Moreover, the agreeable in things may be adumbrated to us by ſmooth and pleaſant ſounds, and the diſagreeable by ſuch as are harſh and grating.

With regard to the ſpecies of beauty which we have been deſcribing and exemplifying, we may obſerve, that it is, in many caſes, more the creature of the reader's fancy than the effect of the writer's ingenuity ; and as it occupies the loweſt rank in the ſcale of rhetorical excellence, it ought always to give place to the other virtues and ornaments of elocution, and not *vice verſâ*. The caſes in which it ought to be aimed at are comparatively few. Compoſitions in proſe, thoſe excepted which are intended to perſuade, and which aim at a certain vehemence of ſtyle and ſentiment, ſhould hardly ever be allowed to exemplify the reſemblance above-mentioned ; and even in poetry, this beauty ſeems naturally adapted only to the moſt pathetic paſſages, and moſt deſcriptive parts. In poems in which it is moſt ſuitable, it ſhould be admitted only in a few paſſages, when it is the author's intention to deſcribe ſomething that is peculiarly ſtriking.

In the inquiry how far vivacity may be affected by the number of words that are uſed, our author concurs with others in laying it down as a maxim, that the fewer the words are, provided neither propriety nor perſpicuity be violated, the expreſſion is always the more vivid. "Brevity," ſays Shakſpeare (Hamlet), "is the ſoul of wit." Of whatever kind the ſentiment be, witty, humorous, grave, animated, or ſublime, it is certain that the more briefly it is expreſſed, the energy is the greater, or the ſentiment is the more enlivened, and the particular quality for which it is eminent the more diſplayed.

Among the Lacedæmonians, who were remarkable for conciſeneſs, to uſe few words, to ſpeak energetically, and to be laconic, were almoſt ſynonimous. Pope has in a peculiar degree ſtudied conciſeneſs, and rendered it conducive to vivacity. The following example will be ſufficient :

"See how the world its veterans rewards !
A youth of frolics, an old age of cards ;
Fair to no purpoſe, artful to no end ;
Young without lovers, old without a friend :
A fop their paſſion, but their prize a ſot ;
Alive ridiculous, and dead forgot."

The principa offences againſt brevity of diction are, *tautology, pleonaſm*, and *verboſity* ; which ſee reſpectively.

Another circumſtance upon which vivacity of elocution depends is the arrangement of words : and this might be conſidered as it reſpects ſimple and compound ſentences. (See Sentence and Period.) We ſhall here obſerve, that compoſition and arrangement in ſentences, though nearly connected, are not entirely the ſame. Compoſition includes arrangement, and ſomething more. When two ſentences differ only in arrangement, the ſenſe, the words, and the conſtruction are the ſame ; but when they differ alſo in other articles of compoſition, there muſt be ſome difference in the words themſelves, or at leaſt in the manner of conſtruing them. See Campbell's Philoſophy of Rhetoric, vol. ii. p. 158, &c.

VIVALDI, Don Antonio, in *Biography*, the moſt popular compoſer for the violin, as well as player on that inſtrument, of his time. He was maeſtro di capella of the conſervatorio of La Pieta, at Venice. (See Conservatorio.) Beſides fixteen operas which he ſet for the Venetian theatres, and ſeveral others for different parts of Italy, between the year 1714 and 1737, he publiſhed eleven different works for inſtruments, of which a liſt is given in Walther, without including his pieces called "Stravaganze," which among flaſhy players, whoſe chief merit was rapid execution, occupied the higheſt place of favour. His Cuckoo concerto, during our youth, was the wonder and delight of all frequenters of country concerts ; and Woodcock, one of the Hereford waits, was ſent for far and near to perform it. If acute and rapid tones are evils, Vivaldi has much of the ſin to anſwer for. His title of Don was derived from his clerical character. "It is very uſual," ſays Mr. Wright in his Travels through Italy, from 1720 to 1722, "to ſee prieſts play in the orcheſtra. The famous Vivaldi, whom they call the *Prete Roſſo*, very well knows among

among us for his concertos, was a topping man among them at Venice."

VIVAR, in *Geography*, a town of Spain, in Old Castile; 6 miles from Burgos.—Also, a town of Italy, in Friuli; 5 miles N.E. of Aviano.

VIVARAIS, before the revolution a province of France, in Lower Languedoc, on the right side of the Rhône, of which Viviers was the capital; now the department of the Ardêche.

VIVARIO, a town of the island of Corsica; 10 miles S. of Corte.

VIVARO, a small island in the Mediterranean, a little to the east of Ischia.

VIVARY, VIVARIUM, in our *Law-Books*, is sometimes used for a park, warren, or fish-pond, in which living creatures are kept.

VIVER, in *Geography*, a town of Spain, in the province of Valencia; 8 miles N.W. of Segorbe.

VIVERO, a town of Spain, in Galicia, on the river Vivero or Landrova; 18 miles N.W. of Mondonedo.—Also, a river of Spain, in Galicia, which runs into the sea; 12 miles E. of Cape Ortegal.

VIVEROL, a town of France, in the department of the Puy de Dôme; 9 miles S.S.W. of Ambert.

VIVERON, a town of France, in the department of the Dora, on a lake; 10 miles S. of Ivrea.

VIVERRA, in *Zoology*. See FERRET and MUSTELA.

VIVERRA, in the *Linnæan System*, is a distinct genus of the order Feræ (though united by Pennant and Shaw to the genus *Mustela;* which see), the characters of which are, that it has six cutting-teeth, the intermediate being shorter; one of the canine teeth on each side longer than the rest; the grinders more than three; the tongue bending backwards, often aculeated; and the nails extended. Gmelin reckons twenty-seven species, which are as follow.

ICHNEUMON; Grey Ichneumon. With distant thumbs, and tail gradually tapering from a thick base, and tufted at the end. This is called the rat of Pharaoh. See ICHNEUMON.

MUNGO; Rufous-grey Ichneumon. With distant thumbs, and untufted tail, gradually tapering from a thick base: the Indian ichneumon of Edwards; the quil or quiopele of Ray; and the mangouste of Buffon. Shaw suggests that this may be a variety of the former; and he observes, that the ichneumon is a species of which there seem to be two distinct varieties, one of which (*viz.* the latter) is a native of India, and the other (or former) of Africa: they are alike in general appearance, but the Egyptian variety is considerably larger than the Indian, and has its tail tufted at the end, and thus differing from the Indian. In India, as well as in Egypt, the ichneumon is regarded as one of the most useful and estimable of animals; as it is an inveterate enemy to serpents, rats, and other noxious creatures which infest those regions. (See ICHNEUMON.) In India, it attacks with great eagerness and courage that most dreadful reptile, the cobra de capello, or hooded snake, and easily destroys it. For such purposes it is domesticated as the cat is in Europe. It is said to swim and dive occasionally, like the otter, and to continue for a long time under water. This animal is found, not only in various parts of India, but in the Indian islands, as Ceylon and others. It occurs also in various parts of Africa besides Egypt, as in Barbary and the Cape of Good Hope, &c.

CAFRA; Yellowish-brown Weasel. With tail gradually tapering from a thick base, and black at the tip. This animal, resembling, in its general form, the pole-cat, and nearly the length of the otter, with blackish feet and very short ears, covered with woolly fur, is a native of the Cape of Good Hope.

ZENIK; Four-toed Grey Weasel. With ten transverse black bands on the body, and deep chesnut-coloured tail, black towards the tip; it is about the size of a water-rat, with a long snout, and two incisive and six canine teeth in each jaw; it has five toes on each foot; the claws on the fore-feet being very long, and almost straight; and those on the hind-feet are small and crooked. It is described by Sonnerat as a Caffrarian species, being found in the country of the Hottentots.

TETRADACTYLA, or SURIKATTE; the Grey-brown Weasel. With four-toed feet, and long moveable snout, and ferruginous tail, black at the tip: the suricate of Buffon, and four-toed weasel of Pennant. It is an inhabitant of the Cape of Good Hope, where it is called Meer-rat. It feeds on flesh, and preys on mice and other small animals. It commonly sits erect like the squirrel, and when pleased, makes a rattling noise with its tail, from which circumstance it has obtained, among the Dutch inhabitants of the Cape, the name of Klappermaus. It is also found in the island of Java, where the Dutch call it Surikatje, on account of a peculiar acid scent which it is said to emit.

NASUA; Rufous Weasel. With tail annulated with white, and lengthened moveable snout: the coati of Marcgrave, and coati-mondi of others, and Brasilian weasel of Pennant. Its size is equal to that of a cat; its colour cinereous-brown, with a cast of reddish, and tail annulated with distinct circles of black. Like the pole-cat, it preys on the smaller quadrupeds, birds, &c. It is a native of South America. Some animals are distinguished by a prolongation of the skin at the back of the head into several horny processes, about a quarter of an inch in length; and the upper part of the tongue is marked with several furrows, disposed so as to resemble the fibres of a leaf.

NARICA; Brownish Weasel. With tail of the same colour, and lengthened moveable snout: the coati-brun of Buffon, and dusky weasel of Pennant; reckoned a variety of the former both by him and Shaw. However, it is larger than the former, of a browner colour, and without any very distinct variegations on the tail. It feeds on animals and vegetables; goes into the water, and also climbs trees. It is found in South America.

VULPECULA; Dark-chesnut-coloured Weasel. With lengthened snout: the coasse of Buffon, and stifling weasel of Pennant. It is about the size of the pole-cat, of a deep or blackish chocolate colour, that of the tail sometimes mixed with white. This animal is a native of Mexico, and many other parts of America, and when attacked or irritated in pursuit, emits very powerfully offensive effluvia.

QUASJE; Chesnut-coloured Weasel. Beneath yellowish, with prolonged snout and annulated tail; is found at Surinam, and feeds on worms, insects, and fruits, and is fetid. Probably a variety of the coati-mondi, or Brasilian weasel.

PUTORIUS; Blackish Weasel. With five parallel, white, dorsal stripes: the striated weasel of Pennant, and conepate of Buffon: supposed to be the female of the V. vulpecula. Found in North America. It is sometimes tamed, and rendered domestic. See MUSTELA *Putorius*.

CONEPATL; Blackish Weasel. With two white dorsal lines extending along the tail. It is a native of New Spain, and probably a variety of the preceding.

MEPHITIS; Brown Weasel. With white back, marked with a longitudinal black stripe: the skunk weasel of Pennant, and chinche of Buffon. In manners and smell this species resembles the two preceding.

The

The *V. Chinge* of Molina, or black weafel, with a changeable caft of blue, and a row of white fpots from head to tail, refembles in fhape and general form the *chinche* juft mentioned; but its colour is black. It is a native of Chili. According to Molina, its fmell proceeds from a greenifh oil, ejected from a follicle or receptacle near the tail. The Indians are faid to value the fkin of this fpecies on account of its beauty, and to ufe it for various purpofes, quilts, &c.

Zorilla. Weafel variegated with black and white: the zorilla of Buffon; the mapurito and mafutiliqui of Gumilla, &c.; fmaller than the three preceding. A native of Peru and other parts of South America. The ground-colour is black; the tail as bufhy and elegant as that of the mephitic weafel. It poffeffes the fame faculty with the three former fpecies.

Mapurito; Black Weafel. With fnow-white band from the forehead to the middle of the back, and without any external ears. This is the V. putorius of Mutis. Its tail is nine inches long, and whitifh at the tip. It inhabits New Spain, burrows under-ground, feeds on worms and infects, and may, perhaps, be a variety of the mephitic weafel.

Vittata; Blackifh Weafel. With a broad white band from the forehead to each fhoulder: the grifon of Buffon; a native of Surinam, and found at Pamplona, in New Spain, and probably in every part of South America.

Zeylanica; Cinereous Weafel. Mixed with brown; whitifh beneath; refembling the martin, and fufpected by Schreber to be the fame with the Ceylonefe dog of Vofmaer. It is found in Ceylon, and probably in the Philippine ifles.

Capensis; Black Weafel. With grey back edged with white. This is the ftinkbinkfen of Kolbe, and ratel weafel of Pennant. It is one of the larger animals of the genus; cinereous-grey above, and brownifh-black below, the two colours being feparated along the whole length of the animal, from the bafe of the nofe to the tail, by a ftripe of black and white; when purfued it ejects a fetid liquid, accompanied with the intolerable fmell of that of the American weafels, or fkunks, and producing the fame effects. It is found at the Cape of Good Hope, and in Guinea.

Mellivora. With cinereous back, with a black lateral band; the abdomen black; the claws long, hollow beneath, and formed for burrowing. This is the ratel of Sparrmann, feeding principally on the honey of wild bees, and found about the Cape of Good Hope. This honey-weafel has a very tough and loofe fkin, with thick hair, fuppofed to be given to it as a natural defence againft the ftings of bees. Mr. Pennant feems to have confounded this animal with the V. capenfis; both fpecies feed on honey; but Mr. Sparrmann does not mention any offenfive effluvia in his defcription.

Civetta; Afh-coloured Weafel. Spotted with black, with chefnut-coloured mane, and dufky tail fpotted towards the bafe. This is the felis zibethi of Gefner and Aldrovand, and the civette of Buffon, and commonly known by the name of the civet cat. It is a native of feveral parts of Africa and India. It is of a mild difpofition, preys on birds and fmall quadrupeds, and produces the drug called *civet;* which fee.

Zibetha; Afh-grey Weafel. Striated with black undulations, and an annulated tail. It is the felis zibethi of Gefner, and zibet of Buffon. Pennant regards it as the fame fpecies with the former, but it is generally confidered by modern naturalifts as diftinct. It is found in India, and the Indian iflands, and may be called the Indian, whilft the former is denominated the African civet cat. In difpofition and manners they both feem to agree; as well as in the fecretion of the perfume before-mentioned, which is collected from both animals in the fame manner.

Hermaphrodita; Dark-grey Weafel. With three black dorfal ftripes, and long tail with black tip. Schreber has defcribed this fpecies from Dr. Pallas. It is a native of Barbary.

Genetta; Fulvous-grey Weafel. With the body marked with rows of black fpots, and annulated tail. It is the genette of Buffon, and one of the moft beautiful animals of the genus, and about the fize of a fmall cat. Its difpofition is mild, and it is eafily tamed. In various parts of the Eaft, and particularly at Conftantinople, it is domefticated like the cat, and no lefs ferviceable in clearing houfes from rats and mice. It is a cleanly animal, and has a flight mufky fmell. It is a native of the weftern parts of Afia, and is faid likewife to occur in Spain, and in fome parts of France. The French variety, however, is lefs elegantly and diftinctly fpotted than the Oriental genet; and Mr. Pennant confiders it as a diftinct fpecies, under the name of "Pilofello."

Fossa; Afh-coloured Weafel. Spotted with black, and with annulated tail. This is the foffane of Buffon, and fo nearly allied to the genet, and of the fame fize, that it might be taken for a variety of the fame animal. It is a native of Madagafcar, Guinea, Bengal, Cochinchina, and the Philippine iflands: it is fierce, and with difficulty tamed. It deftroys poultry like the common weafel: when young, it is faid to be good food.

Tigrina; Yellowifh-grey Weafel. With brown variegations; annulated tail tipped with black or brown, and a black ftripe from head to tail. This is the chat-bizaam of Vofmaer, and the blotched cat of Pennant; of the fize of the cat, and of mild manners. Mr. Pennant has referred it to the genus Felis, but Mr. Schrader makes it a Viverra. It is found at the Cape of Good Hope. Gmelin fuggefts that it may be a variety of V. foffa.

Caudivolvula; Yellow Weafel. Shaded with dufky, with prehenfile tail: the yellow macuaco and yellow weafel of Pennant, and le kinkajou potot of Buffon. It is an animal of gentle manners, active and playful, and hangs by its tail occafionally, like the prehenfile-tailed monkeys. Suppofed to be a native of Jamaica. The kinkajou of Buffon is fuppofed by Pennant to be a diftinct fpecies, and called Mexican weafel. It was brought from New Spain; and is defcribed as fond of vegetables of various kinds, and delighted with fugar and different fweets; and would feize on birds, and fuck the blood without tearing its prey. It flept much by day, and was lively during the night; exhibited the actions of a monkey, and had various cries, fometimes a kind of barking note, at other times hiffing, or varioufly modified.

Fasciata; Grey Weafel. With fix longitudinal black bands, beneath white; the hairs of the tail long, black and reddifh. This is the chat fauvage à bandes noires des Indes of Sonnerat, who firft defcribed and figured it. It is a native of India.

Malaccensis; Grey Weafel. Dotted above with black, with four round fpots above the eyes, and three black bands on the neck and rump, and long tail annulated with black. It is a native of Malacca, defcribed by Sonnerat; of the fize of a domeftic cat, and much allied to the genet and the foffane. It lives by chace, is nimble in climbing trees, and fo fierce, that if it be only wounded when fhot, it will turn back and attack the aggreffor. It diffufes a powerful mufky odour, from a receptacle like that of the civet cat. The Malays collect the fluid there fecreted, and pretend that it is ftimulant and ftomachic. It is much

 efteemed

esteemed for these qualities by the Chinese, who purchase it of the Malays. Of this species there are some varieties.

For other species of weasel, we refer to Mustela and Weasel.

VIVES, a disease of the glandular kind among animals, especially those of the horse kind. In it there is an inflammation of the glands under the ear, which produces a swelling, that gradually enlarges and forms a tumour, that sometimes terminates in suppuration. It is occasionally accompanied with a slight fever, but not constantly. It is mostly caused by cold and other circumstances which have a tendency to produce inflammation.

In these cases, when the inflammatory appearances and fever are moderate, the size of the tumour not large, but after suppurating discharges itself externally, there is little danger; while on the contrary, when the inflammation is more deeply seated, and the swelling breaks and discharges its contents internally, there is more danger to be apprehended.

In the removal of the disease, where the appearances of the fever and inflammation are rather high, it may sometimes be necessary to take away a little blood, as a pint or two, or more, according to the size of the animal, keeping the bowels properly open by the use of suitable food and clysters; and at the same time, the inflamed and swelled gland or part has a fomentation or wash of Goulard's water and camphorated spirit frequently applied to it, by means of a cloth of the flannel or other kind; or, in some cases, where there is a tendency to suppuration, a bran or linseed poultice made up with the same water may be more effectual. A powder composed of nitre and aniseed, in the quantity of an ounce or an ounce and a half of each, may likewise be given at night in a quart of oatmeal gruel.

In case matter be formed, and it can be plainly felt by the gentle pressure of the finger upon the part, the tumour may be opened with a lancet in the most depending part, which will prevent any ulceration of the skin. In cases where the tumours have been very large, a seton is sometimes introduced, in order to support the discharge until the cavity which contained the matter be filled up. In this case, the fomentation need only be continued a few days afterwards, when the wound may be dressed with common digestive ointment spread upon lint. As the wound begins to heal, the seton may be withdrawn.

Where the tumours break inwardly, the animals may often be greatly benefited by breathing occasionally for some time through a nose-bag of scalded bran.

When the animals do not recover their strength in a proper manner, but become weaker and weaker in consequence of the discharges from the opened tumours, bark of the oak or other similar kinds should be given in large quantities, with opium, and aromatic seeds in fine powder, for some length of time.

In the more early stages of the disease, the animals should have mashes of bran and oatmeal, with warm water or thin gruel often given them, and in case the mashes should be refused, the gruel should be more frequently given. And in the latter, when their strength will permit, they should have walking exercise daily, and be well taken care of in their whole management.

While the tumours tend towards suppuration, it is often useful and necessary to keep them warmly covered about the heads and necks, but in other cases this may sometimes be hurtful.

When their strength is fully restored, a dose or two of calomel is often beneficial in completely removing all danger of the complaint.

Vives, Joannes Ludovicus, in *Biography*, was born at Valencia in Spain in 1492, and having laid the foundation of literature in his own country, went to Paris, where he studied the fashionable scholastic philosophy, which he afterwards condemned. From Paris he removed to Louvain, devoting himself there to the study of Greek and Latin literature, and publishing a work intitled "Contra Pseudo-Dialecticos." In this university he became professor of belles-lettres, and acquired a degree of reputation which caused him to be chosen preceptor to William de Croy, afterwards cardinal. He also studied divinity, and wrote a commentary on St. Augustine's book "De Civitate Dei," which he dedicated, in 1522, to Henry VIII. king of England. In consequence of this work he received an invitation, in 1523, to undertake the instruction of the princess Mary, which he accepted. During his residence in England, he composed for the use of his pupil a tract, "De Ratione studii puerilis," and by command of queen Catharine, his treatise "De Institutione Fœminæ Christianæ." At Oxford, where he spent much of his time, he read lectures on law and also in the classics, and was admitted to the degree of D.L.L. Vives forfeited the king's regard by opposing in conversation and writing the divorce of queen Catharine, and was also confined for six months in prison. As soon as he was at liberty he left England, and settled at Bruges, where he married. He was highly esteemed by his contemporaries among men of literature; and so high was his reputation, that he was popularly named with Erasmus and Budæus, as one of the triumvirate at the head of literature at that period. From an epitaph it is inferred that he died after he had completed his 48th year. His works were both various and numerous. In divinity, his treatise "De Veritate Fidei Christianæ," in five books, is represented by Dupin as a learned and judicious performance. His Commentary on St. Augustine displays much erudition, but the Louvain doctors censured some passages as too bold and free, and in their edition of the commentary they were omitted. Dupin is of opinion that his other theological and devotional writings display more of the orator than of the divine; and that Erasmus excelled him in judgment. The principal of his grammatical and critical works were his "Exercitatio Linguæ Latinæ;" "De Corruptis Artibus;" "De tradendis disciplinis." Brucker says of these works; "they discover great strength of judgment, an extensive knowledge of philosophy, much enlargement of conception, uncommon sagacity in detecting the errors of ancient and modern philosophers, particularly of Aristotle and his followers, and, in fine, a mind capable of attempting things beyond the standard of the age in which he lived." The works of Vives were printed collectively in 2 vols. fol. at Basil in 1555. Dupin. Moreri. Brucker by Enfield.

VIVIANI, Vincentio, an eminent mathematician, was born of noble parents, at Florence, in the year 1622. Manifesting at an early period his genius for mathematics, he was recommended by Ferdinand II., grand duke of Tuscany, to Galileo, under whose tuition he made very rapid progress in geometry and the new philosophy. After his death, he was invited by Torricelli to assist him in his experiments on the barometer. But he was chiefly devoted to the study of geometry, and his attention was particularly directed to the ancient geometricians. His first object, at the age of 23 years, was to supply the last work of a contemporary of Euclid, "De Locis Solidis;" and he then proceeded to accomplish the same design with regard to the "Conics of Apollonius;" for an account of which we refer to the article Apollonius. Viviani projected the restoration of the 5th book; with this view he prosecuted his labour with great diligence, and in the year 1659 published his divination of Apollonius. When this work was afterwards

afterwards compared with that of the Greek mathematician, it was discovered that Viviani had not only formed new theories, but that he had discovered many new properties of the conic sections, so that his work may be considered as a supplement to the ancient theory of these curves. In the years 1664 and 1665, he was engaged, in concurrence with Cassini, in concerting means for preventing the inundations of the Tiber, by altering the course of certain rivers: and in their survey of the country for this purpose, they were led to a variety of collateral observations on the insects found in the gall-nut, on marine shells, partly petrified and partly in their natural state, dug up in the mountains, and also on Etruscan vases and inscriptions. In 1666, the grand duke of Tuscany honoured Viviani with the title of his mathematician, which had been previously enjoyed by Galileo; and in 1673 he commenced printing the work of Aristeus, an ancient mathematician, the restoration of which he had at an early period of his life contemplated: but infirmities and other engagements prevented his proceeding with it. In the following year he published, in a small quarto, some works of Galileo, and particularly his Treatise on Proportion, for illustrating the 5th book of Euclid. In 1676, three problems were proposed by M. de Comiers, provost of the collegiate church of Ternant, two of which related to the trisection of an angle, for the solution of which Viviani had discovered three methods, which he now determined to publish. His work on this subject, dedicated to the memory of his friend Chapelain, appeared in 1677. In 1692 he proposed, in the Acts of Leipsic, a problem relating to the art of piercing an hemispherical arch with four equal windows, in such a manner that the remainder of the surface should be absolutely squareable. This problem, which he called a geometrical enigma, was solved by Leibnitz, J. Bernouilli at Basle, the marquis de l'Hospital in France, and by Dr. Wallis and David Gregory in England. Viviani himself published the problem and his own geometrical solution of it in a work, in which he treats, both as a geometer and architect, of the arches of the ancient Romans, and proposes a new arch to be called the Florentine. In 1664 Louis XIV. had settled on him an annual pension, in consideration of his distinguished merit: and in 1669 he was appointed one of the eight foreign associates of the Academy of Sciences. Thus noticed, he was led in 1701 to publish his divination of Aristeus, in three books, dedicated to his benefactor. Part of his pension was devoted by him to the construction of a magnificent edifice at Florence, which he called "Ædes a Deo datæ," and over the gate he placed a bust of Galileo, with several inscriptions in honour of him. In his old age he amused himself with the solution of several problems relating to chances on dice. He also published, for facilitating the study of geometry, an edition of Euclid's Elements, both plane and solid. Viviani, desirous of rendering mathematics in connection with the arts practically useful, was consulted both by his countrymen and foreigners on various public works; and it is stated, that, among other benefits which he conferred on his country, he contributed, by the introduction of new terms in his mathematical and philosophical writings, to render the Tuscan language more copious; but his style is said to be inferior in elegance to that of his master Galileo. After a life of usefulness and honour, prolonged to his 81st year, he died of an apoplexy, in October 1703.

Bayle has accused him of atheism: but Fabroni has refuted the charge. Fontenelle says, "he had that innocence and simplicity which are commonly preserved by persons who have more intercourse with books than with men, without that haughtiness and boisterous rudeness which are often acquired by them. He was affable, modest, sincere, and faithful in his friendships; and what includes many virtues in one, he was grateful, in the highest degree, to those from whom he received favours." His works were numerous. To some of them we have already referred. Fabroni. Montucla. Fontenelle Eloges, &c. Gen. Biog.

VIVIEN, Joseph, a French painter, who, though a pupil of Le Brun, practised his art mostly in crayons, and obtained a degree of reputation, which few who have worked in those perishable materials have arrived at. He was born at Lyons, in 1657. His portraits were fresh and vigorous, and obtained for him considerable employment, and the favour of the elector of Bavaria, who made him his state painter, and gave him a pension. His portrait is among those of distinguished artists at Florence. He died in 1735.

VIVIER, La, in *Geography*, a town of France, in the department of the Ille and Vilaine; 5 miles N. of Dol.

VIVIERS, a town of France, in the department of the Ardêche, on the right bank of the Rhône. Before the revolution, the see of a bishop, and capital of a province, called Vivarais, now the department of the Ardêche; 16 miles S.S.E. of Privas. N. lat. 44° 29′. E. long. 4° 46′.

VIVIFICATION, in *Medicine*, the art of *vivifying*, that is, of contributing to the action that gives life, or maintains life.

The chemists also use the word in speaking of the new force, vigour, and lustre, which, by their art, they give to natural bodies, particularly to mercury; which, after having been fixed, or amalgamated, they restore to its first state. See Revivification.

VIVIPAROUS, Viviparus, in *Natural History*, an epithet applied to such animals as bring forth their young alive and perfect; in contradistinction to such as lay eggs, which are called *oviparous* animals.

The females of all the quadruped class are *viviparous*, and those of the bird class are all *oviparous*.

The laws of nature in the larger animals are, therefore, in a great measure, fixed and certain; but it is not so in the insect tribes, nor in the fishes; for of these, some are viviparous, and others oviparous; and those of genera nearly allied to one another.

Among insects, the much greater number are oviparous; but there are many which are not so, as the pucerons, progall insects, cochineal, &c. The millepedes and scorpions are also well known to be so; all the females of the butterfly, and of some other classes, lay only eggs; but the most singular and remarkable inconstancy in nature, if we may be allowed the expression, is that in the fly kingdom; the same class of insects, and even the same genus, will furnish us with some which are viviparous, and others which are oviparous: the two-winged flies give us instances of this; but these are not singular in that respect; for among the reptile world, there are other creatures which are subject to the same varieties; and Swammerdam has observed a viviparous snail.

The species of viviparous two-winged flies are much more rare than the oviparous; and among the four-winged class they are yet more uncommon. It is not certain, that any of the latter, beside the winged pucerons, are of this kind; but among the former there are six or seven species which are known always to produce living worms, and probably many more will be discovered, by a more close attention than has hitherto been given them.

It is easy to find about our houses one of these species of viviparous

viviparous flies; the creature is always buzzing about the places where meat is kept, and loves to deposit her young, as the common blue flesh-fly does its eggs, on meat. Its way of carrying its wings is the same with that of the blue fly, and its antennæ are of the same form. It at least equals the blue fly in length, but its body is less thick, and is a little bent at the hinder part; its colour is grey; its legs are black; its petty wings whitish, and its reticular eyes reddish.

There are, beside this species, two other of the viviparous flies, which are not uncommon. Both these, in a great measure, resemble the former, but their bodies are shorter, and, in the whole, they much more than the other approach to the form of the blue flesh-fly. They are also smaller than the former species: the one of them, however, on the whole, is not so much so, and, though shorter, yet is much thicker both in the corcelet and body. They are both, though smaller than that kind, yet tolerably large flies, and are bigger than the common horse-fly.

On the leaves of ivy also there are often seen, about autumn, two other species of viviparous flies, which are easily distinguished from all the others. Those of one of these species are larger than the great blue flesh-fly, and have a shorter and thicker body than that kind. The manner of carrying the wings is also the same in both; but though both have antennæ of the battledore kind, yet they are evidently distinguished by this, that the extremities of the one are lenticular, and those of the other prismatic. Near the origin of each wing these have a brownish spot, as have those oviparous flies which usually have in their body only two large eggs at a time, and which are produced of the yellow worms, so common in cow-dung. But these viviparous ones differ from those flies, in that they are larger, and of a deep, but dead brown; whereas the others are black, or nearly so.

The other species is not much unlike this in form, but is smaller, being not more than of the bigness of the blue flesh-fly, and of a blueish-black; so that it might easily be mistaken for one of the common flesh-flies, were it not for the two brown spots at the insertion of the wings; and both this and the former species are plainly distinguished from the cow-dung fly before described, by their wanting the gold-coloured down which that has on the fore-part of its head. Reaumur, Hist. Insect. vol. iv. p. 405, seq.

Vipers are distinguished from snakes, in that the latter lay eggs in dunghills, to be hatched by the warmth of them; but the former are viviparous, that is, they keep their eggs within their bellies, aud bring forth live vipers.

In the Philosophical Transactions we have an account of a viviparous fly of the œstrum or gad kind. Dr. Lister tells us, he opened several females of this class, and found, in each, two bags of live white worms. The like is hinted by Aldrovandus. Lister even suspects, that all in this tribe are, in some measure, viviparous.

Viviparous *Sheep Fescue Grass*, in *Agriculture*, a sort which is found on the tops of high mountains, and which is particularly worthy of the notice of the stock-farmer, as it is of a very nutritious quality for sheep, and is said to abound in Spain, and to contribute in producing the fine wool of that country. See Festuca and Grass.

UJUM RAJAH Point, in *Geography*, a cape on the north coast of Sumatra. N. lat. 4° 58′. E. long. 96° 31′.

VIVO, in *Architecture*, the shaft or fust of a column.

The term is also used, in a more particular sense, for the naked of a column, or other part.

VIVOIN, in *Geography*, a town of France, in the department of the Sarte; 14 miles N. of Le Mans.

VIVONNE, a town of France, in the department of the Vienne; 6 miles E. of Lusignan.

VIVUM Linum. See Linum.

Vivum *Sulphur*. See Sulphur.

VIX, in *Geography*, a town of France, in the department of the Vendée; 6 miles S. of Fontenay le Comte.

VIXEN, or Fixen, among *Sportsmen*, denotes a fox's cub.

VIZA, or Bizia, in *Geography*, a town of Romania; 50 miles W. of Adrianople.

VIZAPOUR, a town of Hindoostan, in Baglana; 18 miles S.E. of Chandor.

VIZARD, or Vizor. See Masque.

VIZERABAD, in *Geography*, a town of Hindoostan, in Lahore; 16 miles N. of Ameenabad.

VIZERABY, a town of Hindoostan, in the Baglana country, celebrated for its hot springs; 20 miles N.E. of Basseen.

VIZEROY, a town of Hindoostan, in the circar of Ellore; 10 miles N. of Ellore.

VIZIAMANGALUM, a town of Hindoostan, in Mysore; 13 miles S.W. of Erroad.

VIZIANAGRAM, a town of Hindoostan, in the circar of Cicacole; 108 miles N.E. of Rajamundry. N. lat. 18° 5′. E. long. 83° 36′.

VIZIANAGUR, a town of Hindoostan, in the circar of Cicacole; 33 miles W.S.W. of Ganjam.

VIZIER. See Visier.

VIZILLE, in *Geography*, a town of France, in the department of the Isere; 7 miles S.S.E. of Grenoble.

VIZINI, a town of Sicily, in the valley of Noto; 20 miles N.W. of Syracuse. N. lat. 37° 2′. E. long. 14° 53′.

UK, a river of Russia, which runs into the Uda, 16 miles N. of Udinsk.

UKDE, a town of Arabia, in the province of Yemen; 8 miles S. of Abu-Arisch.

UKELEY, a river of Brandenburgh, which runs into the Rega, near Plate.

UKENSKOI, a town of Russia, in the government of Tobolsk, at the conflux of the Irtisch and the Oby; 196 miles N. of Tobolsk. N. lat. 61° 10′. E. long. 69° 14′.

UKERATH, a town of the duchy of Berg. In 1796, the Austrians established here a strong post.

UKIKITSCHA, a river of Russia, in the government of Irkutsk, which runs into the Olenek, N. lat. 69° 20′. E. long. 117° 21′.

UKINSKOI, a town of Russia, in the peninsula of Kamtschatka; 80 miles N. of Niznei Kamtschatskoi. N. lat. 57° 55′. E. long. 160° 14′.—Also, a cape of Russia, on the eastern coast of Kamtschatka; 60 miles N.E. of Udinskoi. N. lat. 58° 36′. E. long. 162°.

UKIPEN, a small island in the North Pacific ocean, so called by the Russians, probably the same with that called Sledge island by Capt. Cook. N. lat. 64° 22′. E. long. 211°.

UKKASS, a town of Algiers; 10 miles W. of Tipsa.

UKLI KARAGAISKAIA, a fortress of Russia, in the government of Upha; 56 miles W. of Troitsk.

UKRAINE, a name given to a very fertile country, situated on both sides of the river Dnieper, and so fertile, that by the Poles it was always called the "Land of Milk and Honey." It forms now a part of the Russian government of Ekaterinoslav. See Cossacks.

UKSA, a town of Russia, in the government of Viborg; 44 miles

44 miles N. of Serdopol.—Alſo, a river of Ruſſia, which runs into lake Ladoga; 40 miles N.W. of Olonetz.

ULA, in *Surgery*, a gumboil, or a ſmall abſceſs of the gums.

VLACQ, ADRIAN, in *Biography*, a Flemiſh mathematician of Ghent, commenced with Napier and Briggs in facilitating, by means of logarithms, the application of trigonometry to ſcientific and practical purpoſes. The ſervice which he rendered to this branch of ſcience appears partly under the article BRIGGS. But beſides his addition to the work of Briggs, he extended his tables to ſines, tangents, and ſecants, and their logarithms from 10 to 10 ſeconds. Theſe new and ample tables were publiſhed in 1633, with the logarithms of the natural numbers from unity to 20,000.

VLADIMIR, in *Geography*, a town of Ruſſia, and capital of a government, at the conflux of the Kliazma and the Nerl; 100 miles E. of Moſcow. N. lat. 55° 50′. E. long. 40° 22′.

VLADIMIR, *Order of St.*, or as it is expreſſed in the patents, of the prince equal to an apoſtle Vladimir, a Ruſſian order of knighthood, founded by the empreſs Catharine II. on the 22d of September 1782, being her 20th coronation day, for men of merit in the civil or military ſtations. It has four claſſes, of which the ſenior knight receives a penſion, in the firſt claſs 600, and in the fourth 100 rubles. Any perſon who has ſerved faithfully for 35 years may apply for this order; it is worn to a ribband, red in the middle, and on each ſide a black ſtripe: the knights of the two firſt claſſes, as in the other high orders, wear a ſtar on the breaſt. The ſtar is of eight points, interchangeably of gold and ſilver, having a red area, bearing a croſs, with the Ruſſian letters C. P. K. B. "Svætago Revnoapoſtelnago Knæſa Vladimira," *i. e.* the holy apoſtle-like prince Vladimir. Round the badge are the words "Polſa, Tſcheſt i Slava," utility, honour and fame, with a ribband of two black and one red ſtripes. The chapter of this order is held in the church of St. Stephen. In 1790 the number of knights was 716.

VLADIMIRSKOE, in *Geography*, a government of Ruſſia, bounded on the N. by the governments of Jaroſlavl and Koſtrom, on the E. by the government of Nizegorod, on the S. by the governments of Tambov and Riazan, on the W. by Moſkovſkaia, and on the N.W. by Tverſkoe; about 160 miles from E. to W. and 80 from N. to S. N. lat. 55° 20′ to 57° 10′. E. long. 38° to 43°.

ULADISLAUS I., ſurnamed *Herman*, in *Biography*, king of Poland, ſucceeded his brother Boleſlaus in the year 1082. As Boleſlaus had been excommunicated by pope Gregory VII., and the kingdom laid under an interdict, the pope would allow Uladiſlaus no other title than that of duke. The defection of Ruſſia, Pruſſia, Pomerania, and other provinces at the commencement of this reign, obliged Uladiſlaus to have recourſe to arms; and he ſucceeded at length in ſubduing the Pomeranians. Soon afterwards, he was involved in a civil war by the rebellion of his ſons; but the archbiſhop of Gneſna effected a reconciliation, and prince Boleſlaus defeated the Pruſſians and Pomeranians who had taken a part againſt the king during the civil conteſts. In 1103 Uladiſlaus died, at the age of fifty-nine, with the character of a pious and mild ſovereign, too much under the dominion of paraſites and favourites. Mod. Un. Hiſt. Moreri.

ULADISLAUS II., king of Poland, ſon of Boleſlaus III. ſucceeded his father in 1139. Being under the influence of his queen Chriſtina, ſiſter of the emperor Henry V., ſhe engaged him in a plan for gaining entire poſſeſſion of Poland, part of it having been diſtributed among his brothers in ſeparate duchies by the teſtament of their father. He convened the ſtates, but notwithſtanding his eloquent harangue, they refuſed concurring in his project. At length Uladiſlaus took up arms and attacked his brothers; he expelled two of them from their dominions; but uniting together, they fell ſuddenly on the royal army and totally defeated it. The king, deſerted by the Ruſſians who had engaged to aſſiſt him, retired into Germany to the emperor Conrad. At length he was ſolemnly depoſed by the diet, after an inglorious reign of ſeven years, and ſucceeded by his brother Boleſlaus. Uladiſlaus, in conſequence of the interceſſion of the emperor Frederic Barbaroſſa, obtained Sileſia, which was thus ſeparated from the crown of Poland, and has never been re-annexed to it. Uladiſlaus died in 1159. Mod. Un. Hiſt. Moreri.

ULADISLAUS III., king of Poland, ſurnamed from his ſmall ſtature *Loketak*, or cubit's length, having expelled Premiſlaus II. in 1296, obtained poſſeſſion of the kingdom. But the people were ſo oppreſſed by his tyranny and the licentiouſneſs of his ſoldiers, that the ſtates depoſed him in 1300, and elected Wenceſlaus, king of Bohemia, to ſupply his place. He retired firſt to Hungary, then to Rome; but hearing of the diſcontents that prevailed in Poland, he put himſelf at the head of a conſiderable army: and whilſt he was making conqueſts, Wenceſlaus died, and he was reſtored to the throne in 1305; with powers limited and reſtrained. The Teutonic knights having taken poſſeſſion of a great part of Pomerania, he commenced a war with them, which, after alternate defeats and victories, terminated in his recovery of the territories which they had uſurped; Uladiſlaus, during the progreſs of the conteſt, having diſplayed great military talents, combined with humanity and generoſity. He then directed his attention to the arts of peace, and having in the courſe of fifteen years eſtabliſhed his reputation, he indulged himſelf and his queen in a magnificent coronation, with the full conſent of the ſtates and of the ſee of Rome. Soon afterwards he fell into a chronic diſeaſe, which cloſed his life in 1333, the ſtates having previouſly promiſed to elect his ſon Caſimir as his ſucceſſor. Mod. Un. Hiſt. Moreri.

ULADISLAUS IV., king of Poland, obtained the crown by the intereſt of his wife, Hedwiga, daughter of king Lewis, to whom the ſtates had offered the crown on the death of her father, provided that ſhe married with the conſent of her ſubjects, and that her huſband would reſide in the kingdom. Jagello, duke of Lithuania, was the ſuitor of the princeſs, who conſented to embrace the Chriſtian religion, to oblige his ſubjects to be baptized, and to annex Lithuania inſeparably to Poland, and to reconquer Pomerania and the territories uſurped by the Teutonic order. The Poles approved his liberal offers, and interpoſed to gain the conſent of Hedwiga, who was attached to William of Auſtria. At length Jagello's perſon and vivacity, together with the urgent perſuaſion of the people, overcame her reluctance, and ſhe gave her hand to him in 1386, when he was baptized by the name of Uladiſlaus and elevated to the throne. By this alliance, not only Lithuania, but the duchies of Samogitia and Black Ruſſia, were annexed to the Poliſh crown. The Teutonic knights became indignant, and revolted; and having recourſe to arms, took ſeveral fortreſſes before the king was aware of their deſigns. However, he ſoon expelled them, and reduced the palatine of Boſnia, who had revolted, to ſubmiſſion. He then undertook the converſion of the Lithuanians, who were groſs idolaters. With this view he cut down their ſacred foreſts, extinguiſhed their fires, demoliſhed their temples, eſtabliſhed a body of Chriſtian clergy, and erected an archbiſhopric at its capital, Wilna.

Wilna. Leaving his brother Skirgello as his viceroy, he returned to Poland. Skirgello by his barbarity, and the Teutonic knights by their unwarrantable practices, soon occasioned a rebellion, that was not terminated without much bloodshed. This event was followed by a war with the Tartars, in which the lieutenant of Lithuania was defeated by a lieutenant of Tamerlane, and by wars between Poland and Prussia, in which Uladislaus took the field in person, and penetrating into Pomerania, gained a great victory over the knights near Marienburg. Failing to take the town, he consented to grant the knights an advantageous peace. The reputation of Uladislaus induced the Hussites of Bohemia to offer him the crown, but he declined accepting it. After a reign of forty-eight years, generally prosperous and at length tranquil, he died at a very advanced age in the year 1434, highly honoured and much regretted. Mod. Un. Hist. Moreri.

ULADISLAUS V., king of Poland, was the son of the preceding. See LADISLAUS IV. king of Hungary.

ULÆ, in *Ancient Geography*, a people of Asiatic Sarmatia, upon the coast of the Caspian sea. Ptol.

ULAK, in *Geography*, a mountain of Bosnia; 20 miles S.S.W. of Zwornick.

ULAMA, in *Ancient Geography*, a town of Palestine, S.E. of Dio Cæsarea, at the distance of about 12 miles.

ULAMIRSKA, in *Geography*, a town of Russia, in the government of Tobolsk; 48 miles E.S.E. of Yalutorovsk.

VLARDINGEN, or VLAERDINGEN, a town of Holland, formerly the seat of the counts, situated on the N. side of the Meuse; 2 miles W. of Schiedam.

ULATHA, in *Ancient Geography*, a town placed by Josephus between Galilee and the Trachonitis.

ULAUN, in *Geography*, a town of Bengal; 45 miles W.N.W. of Ramgur.

ULBACH, a river of the duchy of Baden, which runs into the Elzach, 4 miles N.W. of Elzach.

ULBO, a small island in the Adriatic, near the coast of Dalmatia; 4 miles W. of Pago.

ULCAMI, or ULCUMI, a kingdom of Africa, on the coast of Guinea, N. of Ardra.

ULCER, in *Surgery*. The word *ulcer*, as professor Thomson rightly observes, does not easily admit of a satisfactory definition. It has, says he, sometimes been used in a more extensive, and at other times in a more limited sense. By some it has been defined to be a solution of continuity in the solid parts of the body, accompanied with the discharge of a purulent fluid. According to this definition, the term ulcer is synonimous with the words sore, suppurating wound, and open abscess. Dr. Thomson thinks this use of the term ulcer too general and indefinite. By others, the term ulcer has been employed to express only those solutions of continuity, from which an ichorous, sanious, or vitiated matter is discharged, attended with a loss of substance in the part. Although professor Thomson thinks more favourably of this definition than the former, we confess our decided preference of the other, for the reasons which this judicious surgeon has himself explained. If we object to calling suppurating wounds, and such abscesses as have burst, ulcers, as long as they discharge healthy pus, what particular reason is there for approving of their receiving this name only when the matter from them happens to be of a bad quality? The healthy or unhealthy state of the discharge from a sore or an abscess, is an accidental circumstance, depending upon the favourable or unfavourable condition of the parts to admit of the process by which they are to be healed. If the preceding capricious method of defining an ulcer were to be sanctioned, every ulcer would cease to be one, when the discharge from it becomes healthy pus; nor could there be any such ulcer as that which has usually been described by the name of the simple, purulent, and healthy ulcer.

In all the foregoing cases, whether sores, suppurating wounds, or open abscesses, the parts can be healed only by one and the same process,—the formation of granulations; and the principal difference in these examples is, that in suppurating wounds and abscesses, there is not always a loss of substance, as in the instances of ulcers. In these, a chasm or breach is actually produced in the part affected by the action of the absorbent vessels in the process of *ulceration*; which see.

The causes of ulcers, says Dr. Thomson, are extremely various. Some of these causes operate more, others less directly; some are limited in their operation to the parts to which they are immediately applied, while the influence of others extends to the general system; and hence a distinction of ulcers, which is in common use, and which must ever continue to be made of ulcers, into local and constitutional. It is only, however, within certain limits, as professor Thomson observes, that even this distinction is well founded; for an ulcer which was at first completely local, may in time affect the system so as to become constitutional; and ulcers which derived their origin from some general affection of the system, may remain after the constitutional affection has been removed, by which they were originally produced.

When an ulcer arises from an internal cause, it is, as professor Thomson has accurately explained, the immediate effect of the process of ulcerative absorption (see ULCERATION); but when a wound, a burn, or an abscess, becomes an ulcer, it is by no means necessary that the process of ulcerative absorption should in any degree whatever have taken place. A suppurating surface, when it is long in healing, or when it is changed from a healthy to an unhealthy state, may, according to the use that is at present made of the term ulcer, become an ulcer, without the process of ulceration having ever been induced. Every suppurating surface, or abscess of long continuance, may, in this extended sense, be regarded as an ulcer; at least, the period at which they cease to be wounds or abscesses, and when they become ulcers is not very distinctly marked. So true, indeed, is this, that in defining and classifying ulcers, authors have always found it necessary to set out from a healthy state of the suppurating surface, or, in other words, to begin the consideration of the subject of ulcers, with what they term a healthy or a simple purulent ulcer.

Ulcers, continues Dr. Thomson, have usually been distinguished from each other, as Fallopius very justly remarks in his treatise upon this subject, by the causes by which they are induced, by the symptoms which they exhibit, and by the parts of the body in which they occur. The want of a disposition to heal in a suppurating surface may depend upon some specific action in the cause from which it proceeds; upon something peculiar in the constitution of the patient in whom it exists; or merely upon an improper mode of management. Hence, the distinction that has long been made of ill-conditioned sores, or ulcers, into those which are specific in their nature, and into those which are simple.

Specific sores, or ulcers, may be occasioned by specific poisons, or by particular diatheses. The sores, or ulcers, which arise from specific poisons, may be either local, that is, confined, like a primary syphilitic ulcer, to one part; or constitutional, that is, liable to occur in any part, texture,

or

or organ, ſuch as ſecondary ſyphilitic ulcers. Of diatheſes prediſpoſing to ulcers, we have examples in the ſcrophulous, ſcorbutic, and arthritic diatheſes, and alſo in the ſyphiloid diatheſis, or that which ariſes not unfrequently in thoſe who have had ſyphilis, from the too free and injudicious uſe of mercury.

In addition to the foregoing obſervations, ſelected from the valuable lectures on inflammation, lately publiſhed by profeſſor Thomſon of Edinburgh, we ſubjoin from the ſame excellent authority a few more general remarks on the ſubject of ulcers.

The appearances, ſays Dr. Thomſon, which different ulcers exhibit, ſeem at firſt view to afford an excellent foundation for diſtinctions among them; and ſo they undoubtedly do in many reſpects. Surgeons have accordingly endeavoured to obſerve, arrange, and claſſify, the various morbid appearances which occur in ulcers, and to give to theſe appearances appropriate and peculiar names. It is probable that every morbid affection, to which the human body is liable, poſſeſſes characters, or exhibits appearances, which are peculiar to itſelf. To diſcover theſe appearances in the ſymptoms of diſeaſes, and in the various modes of their commencement, progreſs, and termination, is at all times the great object which the ſcientific practitioner propoſes to himſelf. It is to be regretted, however, that the characters upon which the diſtinctions of ulcers, as well as of many other local diſeaſes, are founded, are neither very uniform in their appearance, nor very eaſily diſtinguiſhable from one another. Not only are the local appearances, which preſent themſelves in ſimple ulcers, liable to great variations in the different ſtages of the ſame individual affection, but they are often apparently the ſame with, or at leaſt not eaſily diſtinguiſhable from, thoſe which occur in ſpecific diſeaſes, and which require for their cure peculiar modes of treatment. It is this circumſtance which renders it ſo neceſſary for us, in endeavouring to diſtinguiſh and to cure ulcers, to avail ourſelves of all the information which we can procure from the hiſtory of the ulcer, from the nature of the exciting cauſe by which it has been induced, and from the effects of the remedies which have been employed, as well as from the particular appearances which the ulcer itſelf exhibits. But though the diſtinctions, which are taken from the appearances of ulcers, may not at all times enable us to diſtinguiſh thoſe which are ſimple in their nature from others which ariſe from ſpecific cauſes, they are not, ſays profeſſor Thomſon, to be regarded as unimportant or uſeleſs; for, he believes, it will be found, that ſimilar appearances in ulcers require in general, though not always, the ſame local applications, and ſimilar modes of management, whether the ulcers be of a ſimple or ſpecific nature.

Specific diſeaſes render ſome parts more liable than others to attacks of ulceration. Thus, ſecondary ſyphilis appears moſt frequently in the throat; ſcurvy in the gums; cancer in the lower lip; and lupous and ſcrophulous ulcerations in the upper lip, or in the noſe. Cancer ſeldom or never appears primarily in the upper lip; but ſyphilis, when it attacks this part, puts on many of the appearances of cancer; a fact which profeſſor Thomſon firſt learned from Mr. Pearſon, and which he has ſince had ſeveral opportunities of ſeeing confirmed.

Ulcers upon the lower extremity, *cæteris paribus*, are longer in healing than ſores in other parts of the body. This comparative backwardneſs of ulcers of the legs to heal is probably owing to three principal circumſtances: firſt, the diſtance of theſe parts from the ſource of the circulation; ſecondly, the retardation of the venous blood in them in the erect poſition of the body; and, thirdly, the diſturbance and irritation to which ſuch ulcers are frequently expoſed, by the patient imprudently walking about, and neglecting himſelf. The common poſition of the lower extremities is alſo very unfavourable to the quick paſſage of the lymph through the trunks of the abſorbents; and this may be the reaſon why even the ſlighteſt injuries of the lower extremities are often accompanied with a conſiderable degree of œdematous ſwelling.

Sir Everard Home, in his Practical Obſervations on the treatment of ulcers of the legs, mentions ſeveral facts, which ſeem to prove that ulcers are more common in tall than in ſhort men; and that ulcers of the legs heal with more or leſs difficulty, according as they are ſeated nearer to, or more remote from, the feet. Ulcers, unconnected with any ſpecific diſeaſe in the conſtitution, may occur on the legs, as well as other parts of the body, from external or from internal cauſes. Among the external cauſes, ſays profeſſor Thomſon, we may rank contuſions, wounds, burns, and the application of every ſubſtance capable of exciting inflammation. Among the internal cauſes we ought probably to rank the prediſpoſing cauſes. Of theſe, we have not only the diſtance from the heart, and retrograde motion of the blood, but peculiarities of conſtitution, ſuch as temperaments, diatheſes, and idioſyncraſies; which often become manifeſt only from the effects to which they give riſe. Thus, the ſlight ſcratch, or excoriation, which in one perſon will heal without any trouble; in another, though placed in circumſtances preciſely alike, becomes a diſagreeable and troubleſome ulcer. An ulcer, alſo, which is produced in the leg of a perſon of a ſcrophulous diatheſis, though the diſeaſe may never have appeared in the general ſyſtem, often diſcovers a backwardneſs to heal, and in ſome inſtances exhibits ſymptoms that are peculiar to itſelf. The age, mode of life, and habits of the patient, are circumſtances alſo which will modify the appearances, and tend to increaſe the backwardneſs to heal and the obſtinacy of ulcers. Thus, the aged, the ſedentary, and the diſſipated, are known to be more liable to ulcers of the lower extremities, than the young, active, and ſober. See Thomſon's Lectures on Inflammation, p. 426—433.

We ſhall next endeavour to deſcribe the ſeveral principal varieties of ulcers, and the moſt approved methods of treatment.

Simple purulent or healthy Ulcers.—The ulcers, termed *ſimple purulent* by Mr. Benjamin Bell, ſir Everard Home denominates *ulcers in parts, which have ſufficient ſtrength to carry on the actions neceſſary for their own recovery.* As Dr. Thomſon has obſerved, the deſcriptions, which have been given of theſe ulcers by different authors, will ſoon appriſe us, that they differ in no reſpect from healthy ſuppurating ſurfaces. The pus is of a white colour, thick conſiſtence, and readily ſeparates from the ſurface of the ſore. When diluted, and examined with a microſcope, it is found to be compoſed of ſmall globules, which ſwim in a tranſparent fluid. The granulations of a healthy ulcer are ſmall, florid, and pointed at the top. As ſoon as they have riſen to the level of the ſurrounding ſkin, thoſe which are next to the old ſkin become ſmooth, and covered with a thin, tranſparent film, which is afterwards rendered opaque, and converted into cuticle.

The main indications in the treatment of healthy ulcers are, to keep the ſurface, and eſpecially the adjoining integuments, clean, and to prevent the natural proceſſes from being interrupted. According to ſir Everard Home, this will in general be beſt accompliſhed by the application of dry lint, in order to abſorb and retain the ſecreted matter, which

which ſerves as a ſoft covering for the granulations. A pledget of ſimple ointment muſt alſo be laid over the lint, for the purpoſe of hindering the evaporation of the fluid parts of the pus. By this means, the dreſſings will continue ſoft and moiſt, be prevented from becoming adherent to the ſurface of the ſore, and kept in a ſtate in which they can always be removed without pain, or irritation.

In ſome particular examples of healthy ulcers, ſir Everard Home has found rollers or bandages diſagree, cauſing uneaſineſs in the part, and making the ſores loſe their healthy appearance. This, however, is not the uſual effect of a roller in ſuch caſes; but, whenever it is obſerved to be ſo, the bandage muſt of courſe be diſcontinued.

In a few other inſtances, ointments are found to irritate and inflame the neighbouring ſkin, ſo that it becomes neceſſary to leave them off. In ſuch caſes, the ſurgeon may apply over the lint a compreſs of fine linen, wet with water, or the lotio plumbi acetatis.

There are alſo certain ſuperficial ulcers, which will not heal, while kept in a moiſt ſtate, unexpoſed to the air; but which readily heal when allowed to become dry, and covered with a ſcab. Sir Everard Home has made the following general remarks on the ſubject of dreſſings for healthy ulcers.

1. Applications in the form of vapour, and fomentations, ſhould never be employed, as they render the texture of the granulations looſer, and diminiſh the diſpoſition to form ſkin.

2. With reſpect to fluid applications, ſir Everard Home alſo very properly condemns poultices, as well as fomentations. He ſpeaks of alcohol, as being an application, which promotes the formation of a ſcab, when this mode of cure is choſen.

3. In regard to ointments, their only uſe, in caſes of healthy ulcers, is to keep the matter from evaporating. The moſt ſimple ointments are the beſt for the purpoſe, particularly the one compoſed of white wax and olive oil.

The great objections to the common ſimple ointments are, that they ſometimes diſagree with the ſkin, even when recent, and free from all rancidity. When they have acquired the latter quality, they ſtill more frequently create a greater degree of irritation.

4. With reſpect to applications in the form of powder, ſir Everard Home remarks, that when it is deſirable to form a ſcab on the ulcer, any inert powder may be ſprinkled on the ſore; but he prefers dry lint. Nothing ſhould touch the powder, or lint; and to prevent this circumſtance, ſir E. Home recommends applying a little bolſter on each ſide of the ſore, and over them a roller, which will go from one bolſter to the other, in the manner of a bridge.

For healthy ulcers, dry lint is to be regarded as being, upon the whole, the moſt eligible application. When the ſore does not ſecrete pus enough in twenty-four hours to moiſten the lint, the dreſſings are only to be changed every other day.

When a moderately tight bandage is not forbidden by conſtitutional peculiarities, it is uſeful, both in ſupporting the muſcles and ſkin, which are often in a flabby ſtate, from the unexerciſed ſtate of the limb, and in defending the newly formed parts.

We ſhall preſently have occaſion to ſpeak of Mr. Baynton's plan of dreſſing old ulcers of the leg with ſtrips of adheſive plaſter. This method is now not confined to old ulcers, but often adopted with advantage in caſes of ſimple healthy ſores upon the lower extremities.

Of irritable Ulcers.—Theſe are called by Mr. Benjamin Bell *ſimple vitiated ulcers*; and by ſir Everard Home, *ulcers in parts, whoſe actions are too violent to form healthy granulations, either from the ſtate of the parts, or of the conſtitution.* Mr. Bell characterizes this ſpecies of ulcer chiefly by the vitiated ſtate of the diſcharge; while the other gentleman ranks all ulcers under the denomination of irritable, which require ſedative applications for their cure.

According to the obſervations of the latter writer, an irritable and an indolent ulcer cannot always be diſtinguiſhed from each other by mere appearances, though they can be ſo in a few inſtances. The diſpoſition of an ulcer, like the diſpoſition of a conſtitution, can only be accurately aſcertained by determining the actions, which ariſe from the different impreſſions made upon it.

The following appearances, however, are ſaid to afford a deciſive indication of the irritable nature of an ulcer. The margin of the ſurrounding ſkin is jagged, and terminates in an edge, which is ſharp and undermined. The bottom of the ſore exhibits concavities of different ſizes. There is no diſtinct appearance of granulations, but a whitiſh ſpongy ſubſtance is ſeen, covered with a thin ichorous diſcharge. Every thing which touches the ſurface gives pain, and very commonly occaſions hemorrhage. The diſcharge is altered from common pus to a thin fluid, in proportion to the degree of irritability communicated to the ſore by conſtitutional cauſes. The pain of an irritable ſore in general gradually diminiſhes. When it is not conſtant, but comes on in paroxyſms, chiefly in the evening, or night-time, with great violence, convulſive motions of the limb are apt to occur, and to extend to various other parts.

When the foregoing ſigns of an irritable ulcer are not preſent, we muſt form a judgment of the nature of the ſore, by attending to the hiſtory of the caſe, and the effects of various applications upon the diſeaſe. But when ſuch information cannot be obtained, it is the advice of ſir Everard Home, that the treatment ſhould always begin with the ſuppoſition of the ulcer being of an irritable nature.

When an ulcer occurs juſt over the malleolus externus, it is generally of an irritable kind, in conſequence of the nature of the part on which it is ſituated, quite independently of any conſtitutional or local diſpoſition to irritability. Sir Everard Home conceives that the perioſteum, which here lies immediately under the ſkin, becomes the ſeat of the ulcer, is the cauſe of its being very difficult to heal, and gives it an irritable appearance. The fact, that ſores ſituated upon the ligament of the patella, and over the perioſteum of the anterior ſurface of the tibia, aſſume a ſimilar appearance, and are equally difficult to heal, made the above gentleman more confirmed in his ſentiment.

1. On the ſubject of applications to irritable ulcers, ſir Everard Home entertains a favourable opinion of thoſe which are in the form of vapour. The ſteam of warm water has very beneficial effects; but it is not often uſed alone; and, what ſeems curious, its utility is ſaid to be greater in theſe caſes, when the water is mixed with ſpirits. Fomentations, containing opium, are alſo deſcribed as producing conſiderable benefit. The tincture of opium, ſprinkled on flannel wrung out of hot water, and flannels wet with a warm ſolution of the extract of opium, or with a decoction of poppy-heads, are enumerated as eligible applications. A decoction of chamomile flowers, the tops of wormwood, or hemlock leaves, may alſo be uſed with advantage.

There are ſome particular irritable ulcers, however, ſpecified by ſir Everard Home, which are rendered more painful by warm applications. Theſe ſores are repreſented as being generally attended with a mottled purple diſcolouration of the limb for ſome diſtance from them, and a coldneſs of

of the lower part of the leg. They are likewise said to have a tendency to mortification, and it is remarked that this disagreeable event seems to be promoted by warm applications.

2. With respect to moist applications, the linseed-meal poultice is the most simple, and most easily prepared; and as it does not necessarily require any addition of oil, it is to be prepared when the latter ingredient appears not to agree with the sore.

The lotio plumbi acetatis sometimes makes an useful fluid for the composition of poultices for irritable ulcers; but it does not always agree with these sores; and sir Everard Home states, that if it be used a long time, it is apt to excite a kind of paralysis, known by the appellation of the lead colic, or colica pictonum.

In cases of irritable ulcers, the decoction of poppy-heads should not be forgotten, as it is a very excellent liquid for poultices. The carrot poultice is also found to agree better, than most other things, with a large number of irritable ulcers.

If poultices be employed, their use is to be continued as long as the granulations are small, and the ulcer is rapidly diminishing in size, even till the cicatrization is complete. When the granulations become large, and loose in their texture, poultices should no longer be used.

When the weight of a poultice cannot be borne, the surgeon may try the application of lint dipped in one of the following lotions, and covered with a pledget of any simple ointment:—a solution of the extract of opium; a decoction of poppies; the tincture of opium; a decoction of cicuta; the lotio plumbi acetatis composita; or a diluted solution of the nitrate of silver.

Professor Thomson observes with respect to poultices, that, notwithstanding all that has of late years been said against their use in the treatment of ulcers, he is still very partial to their employment in a great proportion of the morbidly inflamed and irritable states into which ulcers are so liable to pass. He declares, that he has often seen irritable ulcers, which had resisted all other means of cure, heal up under the continued use of these applications. Lectures, &c. p. 444.

3. Applications in the form of powders are generally found to be too stimulating for irritable ulcers. Carbon has sometimes been thought to do good; and so has powdered extract of opium, mixed with an equal quantity of carbon, or linseed flour. However, opium sometimes affects the constitution by being absorbed, and sometimes it produces a great deal of pain, irritation, and sloughing.

4. Ointments cannot be said to be frequently proper applications for irritable ulcers; as they are always more or less rancid, and generally disagree with the skin in such cases. Sir E. Home recommends cream as a very useful application, especially in those examples in which warmth is found to do harm. As a substitute for it, the same writer mentions an ointment, composed of hog's-lard, purified by repeated washing in spring water, and then mixed with a small quantity of white wax and rose-water.

The observations made respecting solutions of lead, apply to the unguentum plumbi acetatis.

5. If the horizontal position be necessary in the cure of simple ulcers of the leg, it is still more so in every instance of an inflamed or irritable sore.

6. Irritable sores cannot generally bear the pressure of bandages. According to sir E. Home, however, a slight degree of pressure does good to certain ulcers which arise from weakness, and are somewhat irritable.

7. In the treatment of ulcers in general, and of irritable sores in particular, the surgeon will often find immense advantage from frequently changing the kind of dressing employed. Few cases will continue to heal favourably longer than a certain time under the employment of one sort of application. The surgeon ought therefore to be acquainted with the effects of many different kinds, in order that he may make an alteration as frequently as the state of the case requires.

Of the Fungous Ulcer.—In some cases, as Dr. Thomson observes, the inflammation of the surface of an ulcer is followed by an excess in the growth of granulations; in some, by the death or sloughing of the granulations, and of the parts which surround them; and in others, portions of the surface and edge of the ulcer are removed by the process of ulcerative absorption. The extremes of these states form sores, which are termed *fungous*, *putrid* or *sloughing*, and *ulcerative* or *phagedenic* ulcers. In most instances, however, the surface of an old sore upon the legs manifests but little disposition, after an attack of inflammation, to pass into the state of granulation, or of ulceration. It often remains long in a stationary condition, forming what has been termed an *indolent* or *callous* ulcer.

When the granulations of an ulcer, instead of being small, red, and firm, become large, pale, loose, soft, and flabby; and when, instead of rising to, and remaining on a level with, the surface of the surrounding skin, they rise much higher; the case is technically called a *fungous ulcer*, or *ulcer with hypersarcosis*. This is the case which sir Everard Home has chosen to name *the ulcer in parts, which are too weak to carry on the actions necessary for their recovery*. It is the disease which Mr. Burns describes under the name of the *over-acting* ulcer. We think that professor Thomson, of Edinburgh, is perfectly right in regarding the old name of *fungous*, as less exceptionable than those which have been more recently proposed as substitutes for it. The old name, as this gentleman observes, involves no hypothesis respecting the state or action of the vessels, and merely expresses the fact, that in some suppurating surfaces, the granulations are spongy in their consistence, and too luxuriant in their growth. Lectures, &c. p. 437, 438.

The granulations of these sores are larger, more round on their external surface, and of a less compact texture than those formed on ulcers in healthy parts. Sir E. Home has also noticed their semi-transparent appearance. When they have filled up the cavity of an ulcer to a level with the surface of the body, they do not readily form skin, but, rising up in a still higher manner, often lose altogether the power of producing new cutis. When the parts are still weaker, the granulations sometimes continue gradually to fill up the hollow of the ulcer, and then, all on a sudden, are suddenly absorbed, so as to leave the sore as deep as it was before.

Ulcers may be weak from the first, or become so in the progress of the case. Even granulations of the most healthy kind, if they are not skinned over in a certain time, gradually lose their primitive strength.

Sores on the legs are greatly under the influence of all natural peculiarities of the constitution, and every thing which affects the health. When the constitution becomes in the least weaker or stronger, the appearance of the granulations becomes changed accordingly, and this effect of constitutional weakness or strength on ulcers, is greater in proportion as the sores are further from the source of the circulation.

While the constitution is undergoing any kind of disturbance, the healing of an ulcer is suspended. Mental anxiety is very apt to retard cicatrization.

Such effects of the constitutional kind on ulcers are greater

greater in weak and delicate perſons, than in the ſtrong and robuſt. Change of weather has conſiderable influence over the healing of ſores. Sir E. Home mentions, in proof of this fact, that when there were ſeveral hundreds of ulcers in the Naval Hoſpital at Plymouth, in 1778, every time the weather changed from a dry to a moiſt ſtate, the ulcers univerſally aſſumed an unhealthy appearance; but put on a better aſpect when the weather became dry again.

In the treatment of this kind of ulcer, tonics are to be exhibited, particularly bark and ſteel; and every thing which diſagrees with the conſtitution is to be avoided. Wine and cordial medicines are alſo uſually preſcribed. Porter, however, is deemed better than wine, for working people.

Sir E. Home obſerves, that the firſt object in the local part of the treatment, is to keep the granulations from riſing above the edge of the ſurrounding ſkin. This gentleman very judiciouſly repreſents the greater propriety of preventing the granulations from ever becoming too high by the employment of proper applications, than following the common plan of deſtroying the high granulations with eſcharotics, after they have riſen to an improper height. There cannot be the ſmalleſt doubt, that if the granulations could always be prevented from riſing up too much, the patient would ſuffer a great deal leſs pain.

Inſtead of applying to the ſurface of the ulcers, now under conſideration, lunar cauſtic, blue vitriol, red precipitate, &c. ſir E. Home prefers mixing theſe eſcharotics with other ſubſtances, ſo as to render them only ſtrong ſtimulants, and uſing them in this latter form. He conceives that, when the high granulations are deſtroyed with eſcharotics, the diſpoſition of the ſurface underneath to reproduce them is increaſed, but that this is not the caſe when the luxuriant parts are only ſtimulated ſo as to become abſorbed.

The ſame gentleman ſeems to think, that when animal ſubſtances grow with great rapidity, they are, like vegetable ones, weaker than when produced in a ſlower manner. Hence ſir E. Home is of opinion, that the growth of granulations ought to be checked in the early ſtage of their formation, by ſome reſiſtance which they are juſt able to overcome, under which circumſtances they derive ſtrength from the limited increaſe of action which they are obliged to undergo.

On the ſame principle, according to ſir E. Home, the preſſure of tight bandages is advantageous; and ulcers which heal while the patient is walking about, are not ſo apt to break out again as when healed while the parts are in a ſtate of reſt.

In the treatment of theſe ulcers, when the granulations have come to a proper height, and do not form a thin ſemi-tranſparent pellicle upon their ſurface, they are to be conſidered as weak parts, and treated accordingly. Sir E. Home thinks, that in this circumſtance, the beſt plan, when no particularity of conſtitution forbids, is preſſure made with a thin piece of lead over the dreſſings, and ſupported with a tight bandage.

Although, ſtrictly, we have no topical applications which can directly communicate ſtrength to granulations, there are certainly ſome which prevent the granulations from exhauſting themſelves by luxuriant growth, and ſtimulate them to draw more blood from the arteries, which effects, as ſir E. Home remarks, render ſuch granulations ſtronger.

1. This gentleman very properly condemns, as applications to weak ulcers, all relaxing fomentations commonly employed; and recommends inſtead of them the uſe of ſpirits of wine and the decoction of poppies, in equal proportions, not however to be applied hot.

2. With regard to moiſt applications, the ſame gentleman expreſſes his diſapprobation of poultices, and mentions a weak ſolution of the argentum nitratum as the moſt eligible application in an aqueous form.

3. On the ſubject of powdered ſubſtances, as applications to weak ulcers, ſir E. Home ſays he has often tried bark, and the lapis calaminaris, without perceiving that the former had any power of ſtrengthening granulations, or the latter any virtue in diſpoſing them to form new ſkin; properties commonly imputed to theſe applications.

Sir E. Home entertains no better an opinion of plaſter of Paris, or powdered chalk, employed with a view of promoting the formation of ſkin. Powdered carbon, he ſpeaks of, as being more adapted to irritable, than weak ulcers. He praiſes powdered rhubarb, as particularly applicable to the latter kind of ulcer, becauſe it repreſſes the luxuriant growth of the granulations, renders them ſmall and compact, and diſpoſes them to form ſkin. When, however, the granulations have riſen above the level of the ſkin, it is not powerful enough to reduce them. When the rhubarb is too ſtimulating, it is to be mixed with a fourth part of crude opium in powder.

A piece of lint, a little leſs than the ſore, is always to be put over the powder, and covered with a pledget of ſimple ointment.

4. Ointments, according to ſir E. Home, are particularly apt to diſagree with weak ulcers. When other applications fail, however, greaſy ones may be tried, and the above gentleman gives a preference to the ung. hydrarg. nitrat. mixed with hog's-lard, in the proportion of one to five, or elſe to common cerate, blended with a ſmall quantity of the hydrarg. nitrat. ruber.

Of Indolent or Callous Ulcers.—When the edges of the ſkin ſurrounding an ulcer become thick, prominent, ſmooth, and rounded, and when the bottom of the ulcer is covered with ſmooth and gloſſy raw fleſh, which, as Dr. Thomſon remarks, can ſcarcely be ſaid to be raiſed into granulations, the caſe is called an *indolent* or *callous* ulcer. This is the diſeaſe which ſir E. Home has denominated an *ulcer in parts, whoſe actions are too indolent to form healthy granulations.*

Under the name of callous or indolent ulcer, as profeſſor Thomſon obſerves, authors have included by far the greater number of ulcers which affect the lower extremities. This is the ulcer which, of all the varieties to be mentioned, is perhaps the moſt deſerving of attention; for the callous or indolent ſtate is that into which almoſt all ulcers of the lower extremities have a tendency to paſs, and in which they often continue ſtationary, or nearly ſo, for months or even for years. Moſt of the general rules which have been laid down by practical authors, reſpecting the treatment of ulcers of the legs, and moſt of the improvements which have of late years been introduced into this branch of ſurgery, relate chiefly, if not ſolely, to the treatment of the callous or indolent ulcer. The parts ſurrounding this ulcer may be inflamed or uninflamed. If uninflamed, the caſe is ſimply a callous ulcer; but if inflamed, it then becomes a callous ulcer in an inflamed, vitiated, or irritable ſtate. This laſt is the ſtate in which moſt patients, affected with ulcers of long ſtanding, apply to medical men for advice and aſſiſtance. It is the ſtate in which patients affected with this complaint are almoſt always found, upon their admiſſion into public hoſpitals. Lectures, &c. p. 438, 439.

According to ſir E. Home, the indolent ulcer forms in its

its appearance a complete contrast to the irritable one. The edges of the surrounding skin are thick, prominent, smooth, and rounded. The surface of the granulations is smooth and glossy. The pus is thin and watery, being composed of a mixture of pus and coagulating lymph. The lymph consists of flakes, which cannot be easily separated from the surface of the sore. The bottom of the ulcer forms quite a level, or nearly so, and the general aspect conveys an idea that a portion of skin and parts underneath has been for some time removed, without the exposed surface having begun any new action to fill up the cavity. When, however, the indolence of the ulcer is not so strongly marked, the sore does not correspond to the preceding description, but resembles in appearance the ulcer which possesses an inferior degree of irritability, and it can only be discriminated from it by the circumstance of its receiving no benefit from soothing applications.

When an indolent ulcer does form granulations, these in some cases are all on a sudden absorbed, and in the course of twenty-four hours the sore becomes as much increased in size, as it had been previously lessened in as many days or weeks.

Two varieties of indolent ulcers have received distinct names. In one of these cases, the ulcer is connected with one or more apertures, leading into hollow suppurating cavities: this forms what has been sometimes termed a *fistulous*, and at other times a *sinuous* ulcer. The other variety of callous or indolent ulcer is that which is accompanied with a permanently enlarged, or varicose state of the veins of the limb. This case is often called the *varicose* ulcer, and is frequently very difficult of cure. The practical observations which apply to this particular form of disease, will be found in another article. See VARICOSE *Veins*.

In the treatment of indolent ulcers, the indication is not merely to heal them, but to render the cure as permanent as possible. This is to be effected by changing the nature of the granulations, and using such dressings as will give them a more vascular healthy appearance. When an ulcer, which has existed six months, has been dressed with poultices for a week, the granulations will have partly filled up the hollow of the sore; but they will be found to be large, loose, and glossy. Should the poultice be now discontinued, and some proper stimulating application be used for another week, the granulations at the expiration of this time will have become smaller, more compact, redder, and free from the glossy appearance. Now experience proves that the ulcer, when healed by the latter application, will not be so likely to break out again, as when healed with large, loose, flabby, glossy granulations. Indeed, sir E. Home assures us, that the number of indolent sores which heal under the use of stimulating applications, and do not break out again, are, in comparison with similar cases treated with mild dressings, as four to one.

The callous, or indolent ulcer, as Dr. Thomson observes, changes very readily into an inflamed or irritable one; and the sore is generally in the latter state, when patients first apply to surgeons for relief. Their ulcers are commonly in a temporary state of irritation from neglect, exercise, excesses, &c.

We have already stated, that medicines, in the form of vapour, cannot heal indolent sores, so as to effect a durable cure. Such remedies, however, are proper, when these ulcers assume a foul appearance, and are in a temporary state of irritation. Hence, for the first few days after the commencement of regular surgical treatment, poultices and fomentations are the best applications.

The fomenting liquor may be a decoction of poppy-heads, or chamomile flowers, or simple warm water, which answers equally well. The best poultices are those of bread and milk, linseed meal, and oatmeal. The most advantageous time for fomenting the sore is while the poultice is preparing, which should be changed twice a day.

When an indolent ulcer does not appear to be attended with any particularity, a solution of the nitrate of silver is considered by sir E. Home as one of the best watery applications. It stimulates the granulations, and makes them put on a more healthy appearance. Its strength is to be increased according to circumstances. An ulcer, which at first cannot bear this solution above a certain strength without pain, and an absorption of the granulations, becomes able, after the application has been used about ten days, or a fortnight, to bear it twice as strong: a proof of the granulations having acquired strength.

The tincture of myrrh, a decoction of walnut-tree leaves, and the diluted vitriolic acid, have all been tried as applications for indolent ulcers, and with advantage. A scruple of nitrous acid, mixed with eight ounces of water, forms also another useful local remedy, which, according to sir E. Home, promotes, in a very uncommon manner, the progress of the cure. The first application of diluted nitrous acid gives a good deal of pain, which, however, ceases in about half an hour.

When an indolent sore heals with the diluted nitrous acid, the process of skinning is accomplished with more rapidity, than when other applications are employed; and the new skin is said by sir E. Home to be more completely formed.

The only application, in the form of powder, ever much employed for indolent ulcers, is the pulv. hydrarg. nitrico-oxydi. It cannot be used, however, except for the most indolent sores, as in fact it is an escharotic, and, if applied too freely, destroys every attempt at the formation of granulations upon the surface of the ulcer. When too often used upon a sore of any material size, it will also sometimes produce a violent salivation of the patient. The writer of this article has seen many patients unintentionally salivated in this manner.

Ointments, containing ingredients which are more or less stimulating, have been at all times the favourite dressings for indolent ulcers. "Ointments containing resin, or oil of turpentine, in their composition, to which a small portion of some metallic oxyd, or metallic salt, has been added, were (as professor Thomson observes) till very lately the most approved applications in the management of callous ulcers. Every variety and form of these stimulating ointments had its partisans and recommenders among practitioners; but the truth is, that this kind of ulcer occasionally got well under every diversity in the form and composition of the ointments employed." (Lectures on Inflammation, p. 446.) According to sir E. Home, one of the best ointments for indolent ulcers consists of one part of the unguentum hydrargyri nitrati, mixed with three of hog's-lard. Its strength, however, must be increased, after it has been used a certain time for the same ulcer. This ointment is said to have the good effect of quickly removing the thickening of the edges of indolent ulcers, and the surrounding dark red colour of the skin. It also seems to possess extraordinary efficacy in making the granulations assume a small healthy appearance, and the ulcer, when healed with such granulations, is less likely to break out again. Sir E. Home thinks that the resins and turpentines are not so powerful as the acids and metallic salts, in giving the granulations a healthy appearance, and a disposition to resist being absorbed.

Camphorated

Camphorated ointments are reprefented as being particularly applicable to cafes, in which there is prefent a degree of indolent thickening.

Befides ointments fomewhat ftimulating in their nature, bandages have been found particularly ferviceable to indolent ulcers. The laced ftocking was much ufed, and is particularly recommended by Wifeman. As Dr. Thomfon remarks, however, it is in appearance only, that this mode of bandaging in ulcerated, or varicofe legs, has any advantage over that by the common circular roller. The ufe of the circular bandage, with dreffings compofed of unguentum refinofum and red oxyd of mercury, in different proportions, was fome years ago recommended in a particular manner to the attention of the Englifh public in a very ufeful treatife, which Dr. Underwood publifhed upon the treatment of old ulcers of the legs. He allowed his patients to go about their ordinary occupations, under this mode of treatment, firft, becaufe it was inconvenient for many of them to be confined; and fecondly, becaufe it was found, that many of thofe patients whofe ulcers were healed up during reft, broke out again as foon as they began to take exercife. It muft be acknowledged, that many indolent ulcers do get well under the mode of management recommended by Dr. Underwood. In many perfons the bandaging, and that degree of cleanlinefs which is occafioned by the regular dreffing of their fores, are of infinite fervice; but it is a mode of treatment which does not anfwer in all old and indolent ulcers; for many of them, according to the experience of Dr. Thomfon, become inflamed and irritable under its ufe. He obferves, alfo, that the recurrence of ulcers in perfons who begin to take exercife after being cured, has appeared to him to be often occafioned by their leaving off the bandaging, by their ftanding or walking too much, and by accidental injuries. The part which has been healed up during reft is weak, and requires fupport and careful defence, which it very feldom receives from the clafs of individuals who are moft liable to this fpecies of ulcer. Lectures on Inflammation, p. 447.

The treatment of ulcers with bandages has had of late years a very zealous advocate in Mr. Whateley, who, in the year 1799, publifhed ftrongly in favour of the plan, in his Practical Obfervations on the Cure of Wounds and Ulcers on the Legs, without reft. In the cafes adduced in this effay, very little variety of dreffing was employed; and, with fome exceptions fpecified by the author, preffure was principally relied upon as the means of cure. This gentleman gives a preference to fine flannel rollers, fomewhat lefs than four inches wide.

But of all the improvements which have of late years been introduced into the treatment of old indolent ulcers of the legs, that which was firft propofed and practifed by Mr. Baynton, of Briftol, is by far the moft interefting and important.

Mr. Baynton acquaints us, that the means propofed by him will, in moft inftances, be found fufficient to accomplifh cures in the worft cafes, without pain or confinement. After having been repeatedly difappointed in the cure of old ulcers, Mr. Baynton determined on *bringing the edges of old ulcers nearer together by means of flips of adhefive plafters.* To this he was chiefly led, from having frequently obferved, that the probability of an ulcer continuing found, depended much on the fize of the cicatrix which remained after the cure appeared to be accomplifhed; and from well knowing, that the true fkin was a much more fubftantial fupport and defence, as well as a better covering, than the frail one which is obtained by the affiftance of art. But when he had recourfe to the adhefive plafter, with a view to leffen the probability of thofe ulcers breaking out again, he little expected, that an application fo fimple would prove the eafieft, moft efficacious, and moft agreeable means of treating ulcers.

Although the firft cafes in which Mr. Baynton tried this practice were of an unfavourable nature, yet he had foon the fatisfaction to perceive that it occafioned very little pain, and materially accelerated the cure, while the fize of the cicatrices were much lefs than they would have been, had the cures been obtained by any of the common methods.

At firft, however, the fuccefs was not quite perfect; as, in many inftances, he was not able to remove the flips of plafter, without removing fome portion of the adjacent fkin, which, by occafioning a new wound, proved a difagreeable circumftance, in a part fo difpofed to inflame and ulcerate, as the vicinity of an old fore. He therefore endeavoured to obviate that inconvenience, by keeping the plafters and bandages well moiftened with fpring-water, for fome time, before they were removed from the limb. He had foon the fatisfaction to obferve, that the inconvenience was not only prevented, but that every fucceeding cafe juftified the confidence which he now began to place in the remedy. He alfo difcovered, that moiftening the bandages was attended with advantages which he did not expect: while the parts were wet and cool, the patients were much more comfortable in their fenfations, and the furrounding inflammation was fooner removed, than he had before obferved it to be.

By the mode of treatment here recommended, Mr. Baynton found, that the difcharge was leffened, the offenfive fmell removed, and the pain abated in a very fhort time. But befides thefe advantages, he alfo found, that the callous edges were in a few days level with the furface of the fore; that the growth of fungus was prevented, and the neceffity of applying painful efcharotics much leffened, if not entirely done away. Mr. Baynton gives the following defcription of his method.

"The parts fhould be firft cleared of the hair, fometimes found in confiderable quantities upon the legs, by means of a razor, that none of the difcharge, by being retained, may become acrid, and inflame the fkin, and that the dreffings may be removed with eafe at each time of their renewal, which, in fome cafes, where the difcharge is very profufe, and the ulcers very irritable, may perhaps be neceffary twice in the twenty-four hours, but which I have, in every inftance, been only under the neceffity of performing once in that fpace of time.

"The plafter fhould be prepared by flowly melting, in an iron ladle, a fufficient quantity of litharge plafter, or diachylon, which, if too brittle, when cold, to adhere, may be rendered adhefive by melting half a drachm of refin with every ounce of the plafter: when melted, it fhould be ftirred till it begins to cool, and then fpread thinly upon flips of fmooth porous calico, of a convenient length and breadth, by fweeping it quickly from the end, held by the left hand of the perfon who fpreads it, to the other, held firmly by another perfon, with the common elaftic fpatula ufed by apothecaries; the uneven edges muft be taken off, and the pieces cut into flips, about two inches in breadth, and of a length that will, after being paffed round the limb, leave an end of about four or five inches. The middle of the piece fo prepared, is to be applied to the found part of the limb, oppofite to the inferior part of the ulcer, fo that the lower edge of the plafter may be placed about an inch below the lower edge of the fore, and the ends drawn over the ulcer with as much gradual extenfion as the patient can well bear; other flips are to be fecured in the fame way, each

above

above and in contact with the other, until the whole surface of the sore and the limb are completely covered, at least one inch below and two or three above the diseased part.

"The whole of the leg should then be equally defended with pieces of soft calico, three or four times doubled, and a bandage of the same, about three inches in breadth, and four or five yards in length, or rather, as much as will be sufficient to support the limb from the toes to the knee, should be applied as smoothly as can be possibly performed by the surgeon, and with as much firmness as can be borne by the patient, being first passed round the leg, at the ankle joint, then as many times round the foot as will cover and support every part of it, except the toes, and afterwards up the limb till it reaches the knee, observing that each turn of the bandage should have its lower edge so placed as to be about an inch above the lower edge of the fold next below.

"If the parts be much inflamed, or the discharge very profuse, they should be well moistened, and kept cool with cold spring-water poured upon them as often as the heat may indicate to be necessary, or, perhaps, at least, once every hour. The patient may take what exercise he pleases, and it will be always found, that an alleviation of his pain and the promotion of his cure will follow as its consequence, though, under other modes of treating the disease, it aggravates the pain, and prevents the cure.

"These means, when it can be made convenient, should be applied soon after rising in the morning, as the legs of persons affected with this disease are then found most free from tumefaction, and the advantages will be greater than when they are applied to limbs in a swollen state. But at whatever time the applications be made, or in whatever condition the parts be found, I believe it will always happen, that cures may be obtained by these means alone, except in one species of the disease, which seldom occurs, but which will hereafter be described. The first application will sometimes occasion pain, which, however, subsides in a short time, and is felt less sensibly at every succeeding dressing. The force with which the ends are drawn over the limb, must then be gradually increased, and when the parts are restored to their natural state of ease and sensibility, which will soon happen, as much may be applied as the calico will bear, or the surgeon can exert; especially if the limb be in that enlarged and incompressible state which has been denominated scorbutic; or if the edges of the wound be widely separated from each other."

In adopting the preceding method, Mr. Baynton sometimes observed a breaking of the skin near the ulcers; a circumstance which sometimes proved troublesome, and arose partly from the mechanical effect of the adhesive plasters, and partly from the irritating quality of the plaster. Mr. Baynton, however, only considers such sores of serious consequence, when they are situated over the tendon of Achilles, in which situation they are sometimes several weeks in getting well. In order to prevent them, Mr. Baynton recommends a little bit of soft leather to be applied to the parts which are in danger of being affected.

The cures will generally be accomplished very well by the mere application of the slips and bandage; but when the parts are much inflamed, the secretion great, or the season hot, Mr. Baynton states, that the frequent application of cold water will be found a valuable auxiliary. See A Descriptive Account of a New Method of Treating Old Ulcers of the Legs, by Thomas Baynton, 2d edit. 1799.

Of the Malignant or Putrid Ulcer; or Hospital Gangrene.—This is a disease which is of a very peculiar nature, and its history must be highly interesting to every practitioner, whose avocations make him likely to have the care of a large number of patients who are afflicted with ulcers or wounds, and collected together in one building. The surgeons of the army and navy in particular, and those of great hospitals and prisons, ought to be fully acquainted with the subject; for they are all liable to be suddenly called upon to exert their skill in checking the ravages of this severe complaint, the treatment of which is far from being either simple, or well determined.

The symptoms by which the malignant ulcer, or hospital gangrene, is characterized, are partly of a local, and partly of a constitutional nature. According to professor Thomson, these two classes of symptoms are not invariable in the order of their appearance; but his own observations lead him to believe, that the constitutional symptoms usually precede the local. He observes, that, in the progress of the constitutional symptoms, a general uneasiness is felt before any visible change takes place in the wound, or sore, which is attacked with hospital gangrene; the tongue becomes foul, with a sensation of bitterness in the mouth; the appetite decreases, and the patient begins to loathe his food; the pulse becomes very quick, but is in general rather weak than strong; the skin feels hot; and the patient in the progress of the disorder becomes affected with great anxiety and restlessness.

The local appearances of wounds, sores, and ulcers, are soon altered after the commencement of an attack of hospital gangrene. Their surfaces become pale; the discharge of pus becomes less copious and less healthy than formerly; their edges swell, inflame, and become exceedingly painful; they are sometimes ragged; at others reverted, and exhibit a soft spongy appearance. A dusky red-coloured circle of inflammation, having more or less of a livid tinge, extends from these edges into the surrounding integuments, and is often the forerunner of gangrene and sphacelus. Inflamed lymphatic absorbent vessels are sometimes to be observed, extending from the surfaces affected with hospital gangrene, to the contiguous, or communicating, cervical, inguinal, or axillary glands.

The local affection in hospital gangrene seldom occupies at first the whole surface of extensive wounds or sores. It more frequently appears in the form of dirty white ash-coloured sloughs, occupying only one, two, or more small spots, and from these, it gradually extends itself over the whole of the diseased surface. In some instances, hospital gangrene begins in the form of a small inflamed pimple, or vesicle, without our being able to perceive any previous injury of the part in which it appears. More frequently, however, it attacks parts which have been scratched, bruised, or wounded, or which have had the integuments injured by ulceration, burns, or blisters. Specific sores, or ulcers, seem to be less liable to attacks of hospital gangrene, than those which are of a simple nature. Dr. Thomson has seen it, however, repeatedly attack cancerous sores and venereal ulcers. In some instances, it has been said to have produced a cure of these diseases, destroying by mortification the parts on which they were situated. In severe cases of hospital gangrene, the surface of the wound, or sore, which it attacks, is soon changed into sphacelus, and covered with dirty white-coloured sloughs. During the separation of these sloughs, an ill-coloured and sanious discharge, having a peculiar fetid smell, takes place from the surface of the wound, or sore. This surface is often seen covered with a tenacious viscid pus, which firmly adheres to the surface from which it is secreted. In mild cases, the destructive effects of hospital gangrene are confined to the skin and subjacent cellular membrane; but it often extends its ravages beyond these textures, destroying tendinous

fasciæ,

fasciæ, muscles, ligaments, and tendons, together with the nerves and blood-vessels. Artery seems to be the texture which resists most powerfully the destructive action of hospital gangrene, as well as of most other species of mortification. When, in the progress of hospital gangrene, adhesive inflammation does not occur, hemorrhage is liable to take place, and, in some instances, to prove fatal. Even in cases in which distinct hemorrhage does not occur, a thin bloody sanies is often discharged, which has a very offensive smell; and the pus, which begins to appear during the separation of the slough, or mortified part, often continues for days to be reddened by an admixture of blood.

The severity and progress of the symptoms in hospital gangrene, as well as the duration of the disease, are extremely different in different individuals. In some, the fever continues with unabated violence for a period of one or two weeks. After suffering an abatement, it is liable to recur; and the patient sometimes sinks under a second or third attack. When the affection has been very severe, has continued long, or has returned frequently, the patient becomes at last generally affected with fever and obstinate diarrhœa. This is a state, from which, if patients recover, it is always in a very slow and tedious manner. See Thomson's Lectures on Inflammation, p. 458—461.

Hospital gangrene (says Boyer) is a species of humid gangrene, which attacks in some degree *epidemically* the wounds and ulcers of patients, who happen to be crowded together in an unhealthy place.

Its occasional causes are; the situation of an hospital upon a low marshy ground; the vicinity of some source of infection; the uncleanliness of the individuals, or of the articles for their use; the crowded state of the wards, especially when they are small and badly ventilated; lastly, every thing that tends to corrupt the air which the patients breathe. An infected atmosphere may produce in the most simple wounds unfavourable changes, partly, as Boyer conceives, by its immediate action on the surface of the wound, but, no doubt, principally by its hurtful influence upon the whole animal economy. The foregoing causes have also sometimes produced alarming and obstinate gangrenes of an epidemic kind, or, at least, a state of the constitution, under the influence of which all wounds and ulcers constantly took on a bad aspect, and were often complicated with the most gangrenous mischief. M. Vigaroux saw such an epidemic disease prevail for twenty months in the two hospitals of Montpellier, and he states, that the most powerful antiseptics were of little avail against the disorder, which often invaded the slightest scratches.

In general, this epidemic species of gangrene is not observed in new-built hospitals, nor in those which are erected out of the central parts of cities, upon high ground. Hospital gangrene may occur in any season; but it is most common after the sultry heat of summer. It complicates, without distinction, every kind of solution of continuity. However, it never attacks those of all the patients in the same ward. It manifests itself in different degrees on the majority of them, and it is remarked, that the more extensive the solution of continuity is, the more it is exposed to the disorder. But, occasionally, the disease is confined to a part of the surface of such solution of continuity, while the rest continues to make progress towards cicatrization. Patients, who have escaped infection once, are not on that account exempt from the danger in future.

A bilious constitution, mental trouble, unwholesome or insufficient food, a scorbutic diathesis, great debility, and fevers of a dangerous type, may become so many predisposing causes of hospital gangrene.

The observations of Pouteau, and those of some other practitioners, convincingly prove, that hospital gangrene may be communicated to the most simple wound, or ulcer, in a subject of the best constitution, and breathing the purest air, by merely putting into contact with such wound, or ulcer, sponges, lint, or charpie, impregnated with the infection of this peculiar disorder. But this inoculation is conceived to be more alarming, and to take effect the more quickly, in proportion as patients have been more exposed to the influence of such causes, as are themselves capable of producing the disease, and also in proportion as the kind of constitution predisposes to it.

Although the contagious nature of hospital gangrene has been generally admitted by all the best informed writers on the subject, we ought to notice, that the doctrine was not considered by Dr. Trotter as having a good foundation. Modern authors, however, have not joined this latter gentleman, and both Dr. J. Thomson and Delpech believe that the disorder is infectious. "The contagious nature of hospital gangrene (says professor Thomson) appears to me to be sufficiently proved, first, by the fact that it may be communicated by sponges, charpie, bandages, and clothing, to persons at a distance from those infected with it. Secondly; by its having been observed to attack the slight wounds of surgeons, or their mates, who were employed in dressing infected persons; and that even in circumstances where the medical men so employed did not live in the same apartment with the infected. Thirdly; by our being able often to trace its progress distinctly from a single individual through a succession of patients. Fourthly; by its attacking recent wounds as well as old sores, and that in a short time after they are brought near to a patient affected with the disease. Fifthly; by our being able to prevent the progress of the disease in particular situations, by removing the infected person, before the contagion, which his sores emit, has had time to operate. Sixthly; by its continuing long in one particular ward of an hospital, or in one particular ship, without appearing in other wards or ships, if pains be taken to prevent intercourse between the infected and uninfected." (Lectures on Inflammation, p. 484.) But although there can be no doubt of the disease spreading partly by its contagious nature, it appears to us equally certain, that the number of cases is also often increased by the continued operation of the same causes which produce the earliest instance of the disorder in any particular hospital. If this were not the case, upon what principle could we account for the origin of the disease at all, since the commencement of the first instance cannot possibly be referred to contagion?

It is alleged, that when once a patient has taken the infection, he cannot avoid the consequences, whatever precautions he may adopt. Thus, Boyer informs us that he has seen hospital gangrene take place in wounded patients, who, in the hope of escaping this epidemic affection, had quitted the infected hospital, and retired to elevated situations, where they breathed the most salubrious air. Traité des Maladies Chir. tom. i. p. 322.

The duration of hospital gangrene is various, according to the extent of the wound, or ulcer affected; the constitution of the patient; the impression made by the putrid effluvia on the animal economy; and the intensity of the disorder. Hospital gangrenes have been known to continue more than a month, in which circumstance, the patients seldom recover. In ordinary cases, the wound puts on a favourable appearance again between the sixth and ninth days; and in slight examples, the amendment is manifested between the third and fifth. Whatever may be the period

of

of the complaint, its wished-for termination is always announced by a diminution of pain; the pus acquiring a white colour and more consistence, and losing its fetid nauseous smell. The edges of the ulcer subside, while its surface becomes less irregular, and puts on more of the vermilion colour. The red, purplish, œdematous circle which surrounds the disease, assumes a true inflammatory nature, and the solution of continuity, restored to a simple state, heals up with tolerable quickness, even when the destruction of soft parts is somewhat considerable, unless any fresh untoward circumstances occur to interrupt cicatrization. But sometimes, when the patient is on the point of being completely well again, his condition is suddenly altered for the worse; ulcerated spots make their appearance on the cicatrix, and these spreading in different directions occasion a relapse, which may happen several times.

Hospital gangrene must be regarded as a serious complication of wounds and ulcers, since it considerably retards their cure. When, however, the solution of continuity is not extensive, and the constitution good, and in other respects healthy, the disease is not dangerous. In this case, as soon as the sloughs are detached, the ulcer heals up, and leaves a cicatrix accompanied with very little disfigurement. But when the solution of continuity is large, or of long standing, the disorder commits much greater ravages, renews its attacks repeatedly, and the relapses prove exceedingly obstinate. The same thing is said to happen when it affects persons labouring under scorbutic or venereal complaints, who are often put into great danger. Hospital gangrene proves particularly dangerous, and mostly fatal, when it complicates large contused wounds, attended with badly fractured bones. All the soft parts of the injured limb are then frequently observed to be progressively destroyed, and the unfortunate patient falls a victim, sometimes to typhoid symptoms attending the complaint, sometimes to frequent hæmorrhages, but still more often to hectic complaints, the almost inevitable consequence of long-continued profuse suppuration.

The effects of hospital gangrene should be carefully discriminated from those of the scurvy. Ulcers, attacked with hospital gangrene, are not affected in any degree, like scorbutic ulcers, by the use of vegetable diet and lemon-juice, and they occur among men who are fed upon fresh meat and vegetables, as readily as they do upon those who have been fed altogether upon salt provisions. (Thomson's Lectures on Inflammation, p. 482.) Hospital gangrene is almost always accompanied with severe febrile symptoms; but, "as to fevers (says Dr. Lind), it may indeed be doubted whether there be any such as are purely and truly scorbutic. The disease is altogether of a chronic nature; and fevers may be justly reckoned amongst its adventitious symptoms." (Treatise on the Scurvy, p. 106.) We may also remark, that in cases of hospital gangrene, the general symptoms of scurvy are absent, such as soreness and bleeding of the gums, livid blotches and wheals on the fleshy part of the legs, œdematous ankles, &c.

The treatment of hospital gangrene is either preventive or curative.

With a view of preventing the disorder, it is essential to remove all the causes which have been specified as capable of producing it. Thus, the wards in which the wounded are placed should not be crowded; they ought to be freely ventilated; as much detached as possible; the utmost attention to cleanliness should be paid; and every source of infection obviated. The predisposition of the wounded to this species of gangrene may be lessened by a well-chosen diet, by drinks acidulated with vegetable acids, or with the sulphuric acid, and by the moderate use of wine. The state of the stomach and bowels should be particularly attended to, and if found to be out of order, emetics and purgatives ought to be immediately employed, and repeated according to circumstances. In the beginning of the constitutional attack, Pouteau and Dussassois particularly recommended the use of emetics, and Mr. Briggs also found them highly useful. It is by the advantageous use of these remedies, that the tendency to bilious fevers is removed, to which all wounded patients are so liable, who have not been evacuated in time; and which (as Boyer observes) always retard cicatrization, and frequently impart to wounds the most fatal complications. After due evacuations, the surgeon should prescribe bitter aromatic decoctions proper to support the tone and functions of the stomach. The dressings should be applied with extreme attention and cleanliness, and too much care cannot be taken to prevent the infectious matter of one wound from coming into contact with another. All fatty resinous applications should likewise be abandoned in the treatment of wounds and ulcers threatened with hospital gangrene. The dressings, says Boyer, should be of a quality calculated to keep up the tone of the parts, without irritating them. According to this professor, such are the decoction, or simple infusion of aromatic plants in spirit of wine; diluted alkaline lotions, &c. Pledgets, kept constantly wet with these applications, are to be applied to the wound.

Such are the means, which, judiciously resorted to, will prevent hospital gangrene, or at least render its occurrence much less frequent. Let us next consider what can be done after the disorder has manifested itself, with a view of assuaging it, before it attains such a degree as puts the patient's life into danger.

No doubt the most certain mode of arresting the progress, or, at all events, of abridging the duration of the complaint, would be to transport the wounded into a more healthy situation, so as to remove them from an atmosphere contaminated by putrid contagious effluvia, and in which the disease has had its first formation. But, as Boyer observes, this change of place is generally impossible. In fact, where is the hospital in which can be found large well-ventilated wards in reserve, separated from every source of infection, and into which the patients can be directly moved on the very first appearance of the disorder? The best built hospitals offer no such accommodation. As then the patients cannot usually be transported into a different ward, the air which they breathe should be purified, by renewing it as much as possible, fixing ventilators, and especially by using the oxygenated muriatic acid fumigations, as recommended by Guyton-Morveau, or else those of the nitric acid.

The nitric acid fumigations are made by putting into a glass vessel on the ground, half an ounce of concentrated sulphuric acid, to which an equal quantity of nitre is to be added *gradatim*. The mixture is to be stirred with a glass tube, when an abundance of white vapour will be produced.

The oxygenated muriatic acid fumigations are made, by mixing three ounces two drachms of common salt, with five drachms of the black oxyd of manganese in powder. These two ingredients are to be triturated together; they are then to be put into a glass vessel; one ounce two drachms of water are to be added, and then, if the ward or chamber be uninhabited, one ounce seven drachms of sulphuric acid are to be poured upon the mixture all at once; or gradually, if the patients are there. This quantity will be sufficient for disinfecting a very large ward. See Lassus Pathologie Chirurgicale, tom. i. p. 38, 39.

When one or more of the patients afflicted with the disorder,

order, before it has become general, are lying in a badly ventilated part of the ward, or near ſome ſource of infection, the ſurgeon can partly counterbalance the diſadvantage of not having a freſh ward, by cauſing the patients to be put into a more airy part of the ward, and as far as poſſible from the quarter in which they contracted the diſeaſe. Diet, internal medicines, and topical applications, form the three eſſential points in the treatment of hoſpital gangrene, after change of ſituation, or purification of the air, when that is impracticable.

When hoſpital gangrene attacks a large wound or ulcer, and the fever attending the complaint is conſiderable, no ſolid animal or vegetable food ſhould be allowed. Where more nouriſhment is required than can be obtained from ſlops, tea, &c. thin rice-milk, weak gruels, &c. will agree better than broth or ſoup, which cannot be digeſted without conſiderable diſorder. In proportion as the heat and irritation of the ſyſtem diminiſh, the rice-milk and gruels may be made ſomewhat thicker, and when the patient can venture to eat ſolid food, new-laid eggs, baked or boiled fruits, vegetable diſhes, fiſh, and even what are called white meats, may be given. The leſs meat, however, the patient eats, the leſs liable will he generally be to a relapſe.

With regard to internal medicines, while irritation and febrile heat accompany hoſpital gangrene, diluent acid drinks are proper, ſuch as nitrated whey ſweetened with ſyrup of violets, lemonade, &c. Blood-letting is admiſſible in but few inſtances, not merely becauſe the orifice made by the lancet is apt to become gangrenous, but becauſe the fever which accompanies hoſpital gangrene is uſually of the typhoid, or aſthenic character. Thomſon, p. 493.

When the ſtomach appears much oppreſſed with bilious complaints, an emetic ought to be adminiſtered. When there is debility, good generous wine ſhould be allowed, either by itſelf, or mixed with lemonade, according to circumſtances. Bark, whoſe antiſeptic qualities have been ſo highly praiſed, is in general more hurtful than uſeful in this diſorder. Boyer, however, allows that it may be beneficially given when the feveriſh heat has abated, and the debility is very great. He thinks alſo that the extract is the beſt preparation.

Acids are not liable to the ſame objections as bark: they are proper in all ſtages of the diſeaſe, and their efficacy, which has been proved in a vaſt number of inſtances, is the more marked, the greater the doſes. The ſulphuric acid is that which is given with moſt ſucceſs; but the acidulous tartrite of potaſſa is alſo an excellent medicine. From two drachms to half an ounce may be given every day, and the beſt plan is to make with it an acid drink, which ſhould be ſweetened and ſtrained.

In ſevere caſes, attended with quick and feeble pulſe, depreſſion, reſtleſſneſs, and anxiety, an opiate becomes neceſſary. "So long as we wiſh to excite a degree of moiſture on the ſkin (ſays profeſſor Thomſon), Dover's powder, or laudanum with antimonial wine, form in general the beſt opiates." This gentleman, however, is not an advocate for the employment of opium in the early ſtage of hoſpital gangrene, while the heat and other febrile ſymptoms are at their height. (See Lectures on Inflammation, p. 494, 495.) For theſe caſes, camphor was highly praiſed by Pouteau.

With reſpect to the local treatment, it is at leaſt as important as the conſtitutional. Indeed, the French ſurgeons conceive that it is much more ſo. "I was told by ſeveral of the French ſurgeons," ſays a late viſitor to Paris, "that they did not rely at all on internal means for ſtopping the progreſs of hoſpital gangrene, and that their experience had proved them to be inſufficient, if not wholly inefficacious. Dupuytren, in reply to the account I gave him of the practice and opinions of Engliſh ſurgeons on this ſubject, aſſured me, that he had no confidence but in local applications; and that internal remedies alone, as far as he had found, did almoſt nothing." The ſame remark has been made in a very recent publication on hoſpital gangrene (Delpech Mém. ſur la Complication des Plaies, &c. 1815.), although it ſeems to be rather at variance with its being a conſtitutional and contagious diſeaſe, which the author has admitted. See Sketches of the Medical Schools of Paris, by J. Croſs, p. 83.

Perhaps there is not a ſingle antiſeptic application which has not been tried as a dreſſing for wounds or ulcers affected with hoſpital gangrene. All watery applications, and common poultices and fomentations, are generally condemned as inefficacious, and even hurtful, in the treatment of this diſorder.

M. Duſſaſſois was convinced by the obſervation of numerous caſes, that the beſt application is powder of bark. He recommends the wound to be covered with ſeveral layers of this powder, which are then to be moiſtened with turpentine. When this compoſition dries, it forms a fragile ſort of coat, at the ſides of which, and through which, the diſcharge eſcapes. After twenty-four hours, the firſt coat is to be removed, and a freſh one applied. In general, four or five ſuch dreſſings are ſufficient in ſimple caſes, where the diſorder is confined to the ſkin and cellular ſubſtance. Healthy inflammation then occurs, the ſloughs come away, and the wound puts on a healing appearance. Duſſaſſois, in bad caſes, ſometimes added one-fifth of powdered muriate of ammonia to the powder of bark. In mild inſtances, as we learn from Mr. Croſs, the modern ſurgeons in France alſo employ with ſucceſs vegetable and diluted mineral acids. P. 84.

But when, by the employment of theſe means, and of the other remedies which have been enumerated, the progreſs of the diſorder cannot be checked, and all the ſurrounding ſoft parts are threatened with deſtruction, Pouteau, Duſſaſſois, and other French ſurgeons, even thoſe of the preſent day, have immediate recourſe to the actual cautery, and repeat the application of it, until the whole ſurface of the ulcer is converted into a firm hard eſchar. Even the edges of the ſolution of continuity ſhould not be ſpared,—"ils doivent être torréfiés et rôtis pour ainſi dire." (Boyer, Traité des Maladies Chir. t. i. p. 332.) The eſchar is then to be covered with a thick ſtratum of bark, moiſtened with turpentine. This application is to be removed in twenty-four, thirty-ſix, or forty-eight hours, and the ſurgeon is then to judge from the appearance of the fleſh, and the quality of the diſcharge, whether a further repetition of the cautery will be neceſſary.

Although we thus find from the accounts of Boyer, Mr. Croſs, and others, that the modern French ſurgeons ſtill regard the actual cautery as the only effectual means for ſtopping the progreſs of bad caſes of hoſpital gangrene, their opinion has fortunately not been adopted in this country. Nothing can be a greater proof of ſuch ſevere practice being at all events unneceſſary, than the fact that many bad caſes of hoſpital gangrene have done well without it, and even its greateſt advocates cannot preſume to aſſert that it will always effect a cure.

Inſtead of the actual cautery, the application of boiling oil has been propoſed; but the advocates for red-hot irons maintain, that the heated oil does not extend its action to a ſufficient depth.

A phlegmonous ſwelling at the circumference of the wound, or ulcer, evinces, that the ravages of the diſeaſe are ſtopped,

stopped, and that suppuration and the detachment of the sloughs are about to follow. In order to promote these desirable changes, Boyer recommends the inflamed parts to be covered with an emollient poultice; but as soon as pus is secreted, the poultice is to be discontinued, as it might relax too much, and some gently tonic application employed, such as the decoction of bark.

When the sloughs have separated, and the bottom of the ulcer appears firm and of a vermilion colour, the rest of the treatment ought to resemble that of a common wound, and the cure then generally follows with tolerable quickness. However, *cæteris paribus*, wounds and ulcers, after an attack of hospital gangrene, heal more slowly than other solutions of continuity.

But when, after the detachment of the eschars, the wound, instead of presenting a firm vermilion appearance, and discharging healthy pus, is covered with pale flabby granulations, the recurrence of hospital gangrene is to be apprehended. With a view of preventing it, the patient is to be purged with a decoction of tamarinds, which Boyer says is preferable to any thing else, and small doses of the acidulous tartrite of potassa are to be given every other day. But if the disease returns, the French surgeons direct the cautery to be used again, if the patient be not too much exhausted to bear it; for when he is, there is no hope from this or any other means. Relapses seldom happen, except in wounds and ulcers which are very large, and have confined the patients a long while in the hospital. A relapse, in these cases, is always an unfavourable omen; for it sometimes proves mortal, and if the patient gets over it, still the ulcers, or wounds, which have been repeatedly affected by it, are apt to degenerate into chronic sores, which it is extremely difficult, or even impossible, to heal. Boyer, Traité des Maladies Chirurg. t. i. p. 320, et seq.

By referring to the various publications, published by English surgeons on hospital gangrene, we shall find that they have succeeded in frequently stopping the disease, without having recourse to that heroic means, (as it is called by M. Roux,) the actual cautery. "The fermenting poultice, spirits, and turpentine, (says professor Thomson,) are certainly much milder applications, and will, I am convinced, when judiciously used, be found to be much more efficacious in effecting a cure. If attention to cleanliness in the dressing of sores and ulcers be at all times required, it is needless for me to remark to you, how much more imperiously it must be required in hospital gangrene, where the discharge from the sores, and probably the effluvia from the body of the patient, are of a contagious nature." See Lect. on Inflammation, p. 500.

Besides the fermenting poultice, camphorated spirits, and turpentine, the following local applications seem eligible; *viz.* decoction of bark; charcoal poultice, especially when the disease is stopped, and the sloughs are separating; the citric acid, with or without laudanum; vinegar; the diluted mineral acids; the vapours of the nitric, muriatic, and oxygenated muriatic acids; a solution of gum kino in equal quantities of claret and port wine.

Of Ulcers attended with some specific diseased Action, either constitutional or local.

1. *Ulcers which yield to Mercury.*—Here we shall exclude from consideration venereal ulcers, as this subject is treated of in the article Lues Venerea. At present we shall only notice such sores as are produced by other diseases of the general system, or of the parts, and are capable of being cured by mercury.

Perhaps there is no greater source of error in the whole practice of surgery, than the supposition, that a sore, when it yields to mercury, must be a syphilitic one. Surgeons, however, who run into this absurdity, can hardly be imagined to be unaware, that so potent a medicine must have effects on numerous diseases of very different descriptions. Sir E. Home very truly remarks, that many ulcers, unconnected with the venereal disease, which receive no benefit from other medicines, heal under a mercurial course, or yield to mercurial applications. In some cases, the ulcer remains in the same state while mercury is used; but begins to look better as soon as the medicine is discontinued, in consequence of the beneficial change produced in the system by the mercurial course. In these cases, mercurial frictions are the best, because they occasion least impairment of the constitution, in consequence of the stomach continuing undisturbed, and capable of digesting well.

Another description of ulcers noticed by sir E. Home, as deriving benefit from mercury, occur on the instep and foot, have a very thickened edge, and are attended with a diseased state of the surrounding skin, so as to bear some resemblance to elephantiasis. They are frequently observed affecting servants who live in opulent families in an indolent and luxurious way. Sir E. Home states, that fumigations with the hydrargyrus sulphuratus ruber heal these ulcers, and resolve in a great degree the swelling of the surrounding parts. In some instances, an ointment of calomel and hog's-lard; in others, the camphorated weak mercurial ointment, is the best application.

Many diseased ulcers, particularly superficial ones, with a thickened edge, may be healed, when they are dressed with a solution of one grain of the hydrargyrus muriatus, in an ounce of water, containing a little spirit.

2. *Ulcers which are curable by Hemlock.*—Sir E. Home places more reliance on hemlock as an external, than an internal remedy for ulcers. The ulcers which usually receive benefit from hemlock applications, look like those of an irritable sort; but the surrounding parts are thickened, in consequence of some diseased action. Such sores occur near the ankle; which joint is at the same time enlarged. Sometimes, but not so often, they take place over the ligaments of the knee. On account of their situation, and the swelling of the joint, they may be suspected to be scrophulous, though they are more sensible than strumous ulcers usually are. The sores just described are rendered less painful, their diseased disposition is checked, and the swelling of the joint diminished, by hemlock. Several irritable scrophulous ulcers are also particularly benefited by this medicine.

Sir E. Home gives the preference to hemlock poultices, unless their weight should be objectionable, in which cases, he advises lint to be dipped in a decoction of the herb, and put on the sore.

Of the ointment made with the inspissated juice, sir E. Home seems to say little in regard to its efficacy.

3. *Ulcers which may be cured by Salt Water.*—Sir E. Home takes notice of other specific ulcers which yield to this application, after resisting other remedies. Poultices made with sea-water are often employed; but this gentleman seems to prefer keeping the part immersed in the water in a tepid state, about a quarter of an hour, twice a day.

When sea-water poultices bring out pimples, in cases of scrophulous ulcers on the legs and feet, sir E. Home informs us, that this disagreeable circumstance may be obviated by diluting such water with an equal quantity of a decoction of poppies. After a time, the salt-water may be tried by itself again. While each fresh poultice is preparing, the part should also be immersed in such water warmed.

When there is a tendency to anasarca, or when there is an

an unufual coldnefs in the limb, unattended with any propenfity to mortification, tepid falt-water may be ufed with infinite advantage.

4. *Ulcers which may be cured by the Argentum Nitratum.*—Sir E. Home notices, under this head, an ulcer, which does not penetrate more deeply than the cutis; but fpreads in all directions, producing ulceration on the furface of the fkin, and often extending nearly through its whole thicknefs. The part firft affected heals, while the fkin beyond is in a ftate of ulceration.

Of this defcription are, a leprous eruption, moftly feen in men impreffed in Ireland; a difeafe of the fkin induced by buboes, which have continued a great while after the venereal virus has been deftroyed; and the ring-worm.

All thefe difeafes are moft eafily cured by applying to them a folution of the argentum nitratum.

The leprous eruption is communicated by contact, and makes its appearance in the form of a boil. This is converted into an ulcer, which difcharges a fetid fluid, by which the furrounding fkin is excoriated, and the ulceration is extended over a large furface. The pain is the moft fevere, and the difcharge greateft, in hot weather. The parts firft difeafed heal, while others are becoming ulcerated, and the difeafe is always rendered worfe, by fpirituous liquors, falt provifions, and catching cold.

Sir E. Home remarks, that the difeafe in the fkin, produced by the effects of very irritable buboes, in conftitutions broken down by mercury, is attended with ulceration of a more violent, deep, and painful kind than the foregoing diftemper. The progrefs of this diforder is, in other refpects, very fimilar to that of the leprous eruption.

Although the ring-worm only occurs in the form of an ulcer in warm climates, a mild fpecies of the affection takes place in fummer-time in this country. It feems to be infectious; though it often occurs without infection. It commences with an efflorefcence, which is attended with very trivial fwelling, and fpreads from a central point. The circumference of the efflorefcence becomes raifed into a welt, while the reft affumes a fcurfy appearance. The welt becomes covered with a fcab, which falls off, and leaves an ulcerated ring, in general not more than a quarter of an inch wide. The outer margin of this ring continues to ulcerate, while the inner one heals, fo that the circle gets larger and larger. The difcharge confifts of a thin acrid fluid, which feems to have a great fhare in making the difeafe fpread.

For all the three preceding difeafes, a folution of the argentum nitratum is ftrongly recommended by fir E. Home.

5. *Ulcers which yield to Arfenic.*—The fores which are named noli me tangere, derive great benefit from this powerful remedy. Sir E. Home obferves, that they are nearly allied to cancer, differing from it in not contaminating their neighbouring parts by abforption, and only fpreading by immediate contact.

From fome cafes which fell under fir E. Home's obfervation, he difcovered that arfenic was not only efficacious as an external, but alfo as an internal remedy. Indeed, experience proves, that, in all cafes of lupus, or noli me tangere, if any medicine is entitled to more confidence than others, it is unqueftionably arfenic.

Sir E. Home is an advocate for its employment, both internally and externally, for ulcers of untoward appearance on the legs. The fungated ulcer is particularly pointed out by this gentleman as being benefited by arfenic. This ulcer occurs on the calf of the leg, and on the fole of the foot. From its furface a fungus fhoots out, which is entirely different from common granulations. The new-formed fubftance is radiated in its ftructure, the bottom of the ulcer being the central point, and the external furface, which is continually increafing, the circumference. The fubftance of this fungus is very tender, and readily bleeds. The firft ftage of the difeafe fometimes has the appearance of a fcrophulous affection of the metatarfal bones; but the parts feem more enlarged, and when the fkin ulcerates, a fungus fhoots out, and betrays the nature of the cafe.

One fpecies of the fungated ulcer is capable of contaminating the lymphatic glands, the other is not fo. The firft is reprefented by fir E. Home as being incurable by arfenic, or any other known medicine.

The fecond yields to this remedy. Sir E. Home ufes a faturated folution, made by boiling white arfenic in water, for feveral hours, in a fand heat. He gives from three to ten drops internally; and, for outward ufe, dilutes a drachm with two pints of water, making it afterwards gradually ftronger and ftronger, till it is of double ftrength. The application may either be made in the form of a poultice, or by dipping lint in the lotion.

The beft and fafeft preparation of arfenic, both for internal and external ufe, is the kali arfenicatum.

6. *Ulcers attended with Varicofe Veins.*—A certain kind of ulcer is very apt to occur on the infide of the leg, and is equally difficult to cure, and liable to break out again. It has the look of a mild indolent fore; but the branches and trunk of the vena faphena are enlarged, and this varix of the veins keeps the ulcer from healing. The fore is feldom deep, ufually fpreads along the furface, and has an oval fhape, the ends of which are vertically fituated. There is a pain affecting the limb rather deeply, extending up in the courfe of the veins, and exafperated by keeping the leg a long while in an erect pofture.

This is a kind of ulcer which derives immenfe benefit from a tight roller, applied from the toes to the knee, although the direct operation of the preffure of the bandage on the fore is itfelf productive of no particular good.

Sir E. Home found, however, that many patients could not bear to wear laced ftockings or tight bandages, and that fome received no relief from them. Hence, this gentleman was led to confider what elfe could be done for the cure of the varicofe ftate of the veins. He reprefents, that, in confequence of the fize of the vena faphena, and its numberlefs convolutions, the return of blood from the fmaller branches is fo impeded, as to retard the circulation in the fmaller arteries, and to interfere with their action in forming healthy granulations. The coats and valves of the veins alfo become thickened, fo that the latter parts (the valves) do not do their office of fupporting the weight of the column of blood.

Thefe reflections induced fir E. Home to think, that fome benefit might be obtained by taking off a part of the preffure of this column of blood, by making a ligature round the vena faphena, where this veffel paffes over the knee-joint. Thus the cavity of the vein at this part would be obliterated, and a kind of artificial valve would be formed.

This gentleman recommends the following way of performing the operation: "As the veins are only turgid in the erect pofture, the operation fhould be performed while the patient is ftanding, and if placed upon a table, on which there is a chair, the back of the chair will ferve him to reft upon; and he will have the knee-joint at a very convenient height for the furgeon. The leg to be operated upon muft ftand with the inner ankle facing the light, which will expofe very advantageoufly the enlarged vena faphena paffing over the knee-joint. While the patient is in this pofture, if a fold of

of the ſkin, which is very looſe at this part, is pinched up tranſverſely, and kept in that poſition by the finger and thumb of the ſurgeon on one ſide, and of an aſſiſtant on the other, this fold may be divided by a pointed ſcalpel, puſhed through with the back of the knife towards the limb to prevent the vein being wounded; much in the ſame way as the ſkin is divided in making an iſſue. This will expoſe the vein ſufficiently; but there is commonly a thin membranous faſcia confining it in its ſituation; and when that is met with, the vein had better be laterally diſengaged by the point of the knife. This is moſt expeditiouſly done by laying hold of the faſcia with a pair of diſſecting forceps, and dividing it; for it is difficult to cut upon parts which give little reſiſtance, and there is a riſk of wounding the vein. After this, a ſilver crooked needle, with the point rounded off, will readily force its way through the cellular membrane connected with the vein, without any danger of wounding the veſſel, and carry a ligature round it. This part, or, indeed, what may be conſidered as the whole of the operation, being finiſhed, the patient had better be put to bed, ſo as to allow the vein to be in its eaſieſt ſtate, before the ligature is tied, and then a knot is to be made upon the vein: this gives ſome pain, but it is by no means ſevere. The edges of the wound in the ſkin are now to be brought together by ſticking-plaiſter, except where the ligature paſſes out, and a compreſs and bandage applied, ſo as to keep up a moderate degree of preſſure on the veins, both above and below the part included in the ligature." See Home's Pract. Obſ. on Ulcers, p. 296, edit. 2.

The foregoing method does not appear to poſſeſs novelty, as it was practiſed by Paré. What is of ſtill more conſequence, it is a plan which is not free from ſerious danger. We have ſeen ſeveral examples, in which the practice was followed by a violent degree of conſtitutional irritation, conſiderable diſturbance of the nervous ſyſtem and a tendency to convulſions.

Mr. Brodie has tried another method of operating, which is ſaid to prove effectual, and to be milder in its conſequences. Some account of it will be found in the article Varicose *Veins*.

On the whole, we believe that there are few caſes in which an operation is adviſable, and that Deſault, Mr. Whately, and ſeveral other ſurgeons, have been perfectly right in giving a preference to the ſafer and more ſimple plan of making methodical preſſure with a bandage.

Ulcer, in animals of the domeſtic or live-ſtock kind, is a wound of ſome ſtanding, ariſing from a ſolution of continuity in ſome fleſhy part of the bodies of them with a loſs of ſubſtance. The term is by ſome, in theſe as well as other caſes, confined to that breach or eroſion of the ſkin and parts immediately connected with it, which either proceeds directly from an internal cauſe, or at leaſt is cloſely concerned with a peculiar ſtate of the conſtitution. Others, however, divide ulcers into two claſſes, the ſimple and the compound: the former being a mere wound of ſome duration, which is capable of being reſtored by nature without the aſſiſtance of art, eſpecially in theſe animals; while the latter is that which is attended with a bad ſtate of the body. But although in theſe inſtances an ulcer may be ſuppoſed to proceed from a vitiated or diſeaſed ſtate of the habit of body in the animal, all common ſores may likewiſe be reckoned ulcers, when they degenerate and contract an ill diſpoſition, whether they take their origin from an internal or an external cauſe. They are, of courſe, of various kinds, according as they are owing to theſe different cauſes. Wounds, bruiſes, and other accidents, when ill-treated or neglected, often occaſion ulcers; as well as a depraved ſtate of the blood and juices, which in the firſt inſtance only produce tumours. Of this kind are all thoſe of the fiſtular and ſome other kinds in theſe ſorts of animals.

Some ulcers too are internal, as in the lungs, liver, kidneys, and other viſcera of animals, where they not unfrequently produce waſtes and decays in them; and ſome are among the joints and ligaments, which are much more common. This is much the caſe in the legs of ſome animals.

There are other diſtinctions alſo occaſionally made uſe of in deſcribing ulcers in ſuch animals; as thoſe of *ſinuous*, *fiſtulous*, *putrid*, *ſcrophulous*, *cancerous*, *varicous*, and ſome others, as their nature may be, and as may be ſeen under the ſame head in *Surgery*.

The ſimple ulcer is always ſuperficial, and attended only with foulneſs, and hard or uneven edges raiſed above the ſurface of the common ſkin. A compound ulcer is, properly, when not only the fleſh is ulcerated, but a caries or decay exiſts in the bone, with other bad appearances in the animal. A cavernous ulcer is that which has a ſmall narrow entrance, with a wide ſpreading bottom part. The ulcers that run aſlant, proceeding from abſceſſes between the muſcles or their tendons, are called ſinuous ulcers: the ulcers that are tubular, ſmooth, and callous on the inſide, and run in ſeveral meanders, are called fiſtulous: and where there is a great efflux of fetid matter, with inflammation, ſwelling, and inward ſickneſs in the animal, ſuch ulcers are ſaid to be putrid. Cancerous and ſcrophulous ulcers are uſually ſeated on the glands, and may be diſtinguiſhed by their particular appearances; the latter being more ſlow in its progreſs, and leſs offenſive than the former, which extends rapidly, and makes great havock on the parts, and ſeriouſly affects the whole conſtitution of the animal. Varicous ulcers are ſeated among the veins, and are always ſoft and diſtended with blood in their parts. There are many of this kind that take place in the legs and other parts of animals of theſe different ſorts.

It is found by experience, that ſimple and ſuperficial ulcers on the ſkin in animals, are not, in general, difficult of cure; but ſometimes their edges riſe above the ſurface-ſkin, and grow callous, in which caſe they require ſome time before theſe can be reduced and cicatrized or healed. An ulcer or caries in the bone is neceſſarily more tedious and difficult to cure than one in the fleſh, and the difficulty is more or leſs, in proportion to the nature of its ſituation, and the cauſes whence it proceeds. Cavernous ulcers often become ſo, merely by their ſituation being in places where compreſſion or bandages cannot be applied; but they are not ſo troubleſome as ſinuous ulcers, eſpecially when the ſinuoſities terminate near a joint, for then they are often attended with great difficulty and danger. Fiſtulous ulcers are attended with all the ſame, or rather greater difficulties, being often ſituated among the joints, and other inconvenient places; a circumſtance which to animals of different ſorts is of bad conſequence, and, for the moſt part, renders them of little uſe, even when a cure is effected. Putrid ulcers are always dangerous, as proceeding from a bad ſtate of the body in the animal; and when they diſcharge very great quantities of fetid matter, they are liable to end in mortification, and the deſtruction of the animals.

Cancerous ulcers are not of leſs ill conſequence, only that there is more reſpite given; as the animals will live languiſhing a conſiderable time with theſe and other anomalous ulcers, as in ſome ſorts of glanders or affections of the noſtrils in horſes, and ſometimes in other diſorders, until they are quite reduced, and the cure in moſt caſes is impracticable.

practicable. Varicous ulcers among the blood-veſſels of the legs or other parts of animals are of a ſpongy nature, and hard to manage, diſcharging, for the moſt part, a bloody ſort of ichor. Of this kind too are ſome of thoſe ulcerations that creep along the veins in the limbs, where they are equally troubleſome and difficult of cure, on account of the exertions of the animals; but a ſimple and ſingle ulcer of this kind may eaſily be healed by ſuitable applications, and a proper uſe of bandages or compreſſion.

In the cure of theſe different ſorts of ulcers, the methods that are directed below, may moſtly be had recourſe to with ſucceſs in moſt kinds of domeſtic animals.

The firſt or *ſimple* kinds, it is thought by ſome, ſeldom need any other management than waſhing them with pure water a little warm, or with ſpirit of wine, and then dreſſing them with pledgets of lint or tow ſpread thinly with digeſtive ointment, compoſed of yellow wax, reſin, common turpentine, and olive oil, in the proportion of two parts of the others to one of turpentine. However, if there be an itching, with ſmall pimples, it is ſometimes adviſed to mix in every four ounces of the digeſtive ointment a drachm of verdigris in very fine powder, and to apply dreſſings with it once a day, or once in two days, if the diſcharge be ſmall. And if little papillæ ariſe in the bottoms of the ulcers, that are of a faint red colour, the dreſſing ointment ſhould be mixed with red precipitate, in the quantity of a drachm of it in fine powder to every two ounces of the digeſtive ointment. Where the ulcers are deep, and do not fill up in a proper manner, as is the caſe ſometimes in weak bad habits of body in the animals, bark, and ſtrengthening remedies of other kinds, will likewiſe be neceſſary, as well as good keep; and the ulcers may be dreſſed with a mixture of common turpentine and myrrh in fine powder put on the pledgets every other day, waſhing them firſt with brandy, ſpirit of wine, or tincture of myrrh, or any other ſimilar application.

The common black and yellow baſilicons too, when made without lard, with oil, ſometimes anſwer in theſe caſes, as they tend to fill up the ulcers with granulations of good fleſh; eſpecially if proper remedies be at the ſame time given internally. It is adviſed alſo, that equal parts of antimony and gum guaiacum ſhould be divided into ounce doſes, and one of them be given every day, with plenty of good nouriſhing food, conſiſting of the beſt ſorts of fodder and oats, with water-gruel for drink in ſome caſes.

In caſes where the ulcers fill up too faſt, and produce a quantity of fungous fleſh, it may be repreſſed by dreſſing with dry powders, ſuch as myrrh and lapis calaminaris, or occaſionally with red precipitate and burnt alum in fine powder, in equal proportions, mixed together; carefully avoiding all greaſy applications. If the fungus continue troubleſome, the dreſſing may be lint or tow, dipped in blue vitriol water, and wrung out dry, and then applied. If the edges be callous, ſo as to make a kind of rim round the ulcers, red precipitate dreſſings are always the beſt. This method has been found by ſome to ſucceed better, in ſome kinds of animals, as the horſe, than either cutting the callous edges off, or eating them down by cauſtic, or deſtroying them by a hot iron. Although ſomewhat ſlower, it is ſuppoſed more ſafe, as not being ſo apt to produce inflammation, which, inſtead of deſtroying ſuch calloſities, frequently renders ſuch ulcers more obſtinate than before, and more liable to fungus.

Theſe ulcers, in their ſimple ſtates, may often be cured ſimply by drawing together, and ſupporting the parts by ſlips of ſticking-plaiſter.

In the *cavernous* kind of ulcers, where they are deep, narrow at their entrances, and wide at their bottom parts, they require to be laid open, or the ſmall orifices of them to be widened by a cauſtic, ſo that no matter may be concealed. Where they are in ſuch ſituations that they can be laid open with ſafety, and the habit of body in the animals is good, they may be cured with the ſame eaſe as almoſt a ſimple fleſh wound, by merely obſerving the ſame methods as in the former caſes. But when they do not fill up by ſuch means as are directed above; and if they be found on probing to have ſinuoſities, they muſt be managed as ſinuous ulcers, as below.

The *ſinuous* kinds of ulcers are a ſort which ſhould be laid open without loſs of time, by inciſion, where it can be properly done, provided acrid injections, ſuch as the ſolutions of blue vitriol, alum, or corroſive ſublimate, have been previouſly tried, and where bandage or compreſſion cannot be uſed; as when they are ſuffered to continue long, they will run deeper and deeper, and often among the tendons and interſtices of the muſcles, ſo as at laſt to make their way to the bones, which become carious in conſequence, and the cure in that caſe is rendered equally tedious and difficult.

The *fiſtulous* kinds of ulcers moſtly take place by there being inflammations and tumours in the parts, which form abſceſſes or collections of matter, which, if not let out and removed by inciſion, and proper preſſure applied, penetrate deeper, and become ſinuous ulcers; which when they have exiſted long, or have occurred in unhealthy animals, ſeveral ſinuſes often form, and the matter makes its way from one to another by ſmall tubes, or communicating paſſages; in which caſes the inſides are commonly lined with callous coats or membranes, ſo that no re-union can be effected until theſe connecting paſſages are laid into one, and their calloſities are deſtroyed. This may moſtly be accompliſhed by proper inciſions being made, when the parts ſhould be dreſſed with levigated red precipitate, or with pledgets of lint or tow dipped in a ſolution of blue vitriol, and phagedenic water, made by diſſolving a drachm of corroſive ſublimate in a pint of lime-water; or when made ſtronger in ſome obſtinate caſes.

Common abſceſſes, on ſome occaſions, by injudicious treatment, are converted into ſinuous and fiſtulous ulcers, where they would perhaps have no ſuch tendency; as by the bad and abſurd practice ſometimes uſed, of introducing long hard tents, that ſeparate the muſcles in the ſame manner as a piece of timber is cleft by a wedge, and by thus tearing the membranes apart, the abſceſſes grow deeper, and even occaſionally run into ſinuſes that lie out of the reach of common applications. The frequent and unneceſſary uſe of the probe too, often promotes the ſame bad conſequences. In abſceſſes, the weight of the collected matter in them occaſions an eaſy ſeparation of the contiguous cellular membrane, ſo as to give way readily to a ſlight force applied by a rude hand, and to form deep ſinuoſities; to prevent which, in all ſuch caſes, the parts ſhould be kept as firm and cloſe by the uſe of a bandage as they are capable of bearing, or a depending opening may be formed for the paſſage of the matter in another direction; a ſeton too may ſometimes be introduced for the ſame purpoſe: ſo that by one or other of theſe methods, moſt bad caſes of this kind may be prevented or removed in theſe ſorts of animals.

In *putrid* ulcers, as whatever may be their origin, they always exiſt under unfavourable ſtates of the conſtitution of the animals, the cure of them will, of courſe, ſtand in need of internal means, ſuch as the uſe of bark, opium, and good nouriſhing food, in as large quantities as they can be taken, with fomentations and cataplaſms of the ſpirituous and opiate

opiate kinds applied in as powerful a manner as poſſible externally to the parts. By theſe means, ſteadily perſevered in, they may often be removed without much difficulty.

The *cancerous* and *ſcrophulous* are ſorts of ulcers that take place in the glandular parts of the bodies of animals. The firſt ſort ſometimes occurs in horſes in bad caſes of glanders and farcy; and horſes have occaſionally cancerous warts, which, when deep ſeated, are liable to become true cancerous ulcers. Some ſuppoſe too that ulcers of this nature take place from ſetons, in ſome caſes, when improperly placed in glandular parts.

In neat cattle, they moſtly begin by hard livid tumours forming themſelves in glandular parts, ſome of which are moveable, others more fixed at firſt, and ſome inflame and quickly break out, diſcharging a thin acrid ſort of ichor, while others are more ſlow in breaking, and diſcharge a more thick matter, being liable to fill up with fungous fleſh. Theſe latter often occur about the face, on the eye-lids, and in the glands about the jaws, being very difficult of healing. There is frequently a ſcrophulous diſpoſition in the parts that keep them up.

In theſe caſes the cure depends much on their ſituation. In ſome inſtances they can be readily removed by cutting the diſeaſed parts wholly out. Some deſtroy the excreſcences by the uſe of cauſtic. Theſe modes are particularly uſed with neat cattle, and ſometimes with other ſorts. After the ulcers have been made clean in their parts, they may be touched all over with cauſtic of the lunar kind, or have red precipitate, in fine powder, duſted on them, and be afterwards dreſſed with ſmall pledgets of tow or lint, dipped in a ſolution of ſublimate in egyptiacum, to which a little tincture of myrrh and ſpirit of turpentine and of ſalt have been added, once a day; any riſing fleſh being kept down by the above cauſtic. In order to fill up ſuch ulcers more readily, in ſome caſes, as where they are clean, and without acrid diſcharge, it may be neceſſary to uſe digeſtive ointment wrought up with the above ſolution, on the dreſſings, once or twice a day.

Mild purges in theſe caſes may ſometimes be beneficially made uſe of to promote the healing of the ulcers, as well as medicines of ſome other kinds.

The hard glandular tumours that produce theſe ulcers may ſometimes be diſperſed at firſt, by the uſe of ſtrong mercurial ointment mixed up with turpentine, well rubbed upon them once or twice a day for ſeveral days, and then leaving it off for a time, to be repeated again if neceſſary. The ſame ointment may likewiſe be employed with more advantage, in ſome caſes, when combined with ſtrong aquafortis and powdered cantharides. See Tumour.

In the cure of the *varicous* kind of ulcers, it has been adviſed by ſome to bathe the parts with aſtringent fomentations prepared by oak and other ſuch barks in proper proportions, or with alum and white vitriol diſſolved in warm vinegar. The matter of theſe ulcers is generally, it is ſaid, of a thin bloody watery nature, which will thicken or dry up by ſuch applications. In caſe the veſſels continue weak and relaxed after ſuch ulcers are healed, firing will ſometimes be uſeful and proper for ſtrengthening the parts, by contracting the coats of the veins that cauſe and promote the ulcers: and in ſome caſes it may be done ſo deeply as to cut off the communication of them. Ulcers of this watery kind, which have ſome affinity to the varicous, take place in horſes in the farcy, and in ſome other diſeaſes of them, as well as other animals.

In moſt caſes of old ulcers in animals, it will be of much uſe to have recourſe occaſionally to calomel, given in doſes of from half a drachm to a whole one, with cooling purges, and good keep, as well as the frequent application of bandages where they can be employed.

By theſe different means properly applied, moſt of the ulcers in different ſorts of domeſtic animals may be ſpeedily removed.

ULCERATION. That the living body ſhould poſſeſs a power of removing portions of itſelf, ſeems at firſt a propoſition ſomewhat extraordinary; but when it is known that there exiſts in the animal body a ſyſtem of veſſels, whoſe peculiar function is to take away the old particles of matter, in proportion as new particles are depoſited by the arteries, the diſappearance of parts then readily admits of explanation by adverting to the power and action of the abſorbent veſſels. In fact, there can be no greater difficulty in conceiving how theſe veſſels remove the particles of the body, than in conceiving how ſuch particles are depoſited by another order of veſſels, named arteries. One of the moſt common examples of the abſorption of particles of the living body in diſeaſe, is that which is every day exemplified in the proceſs of ulceration, by which an actual breach or ſolution of continuity is produced. It was this proceſs which Mr. Hunter uſed to diſtinguiſh by the name of *ulcerative* abſorption.

Ulceration, or ulcerative abſorption (as profeſſor Thomſon obſerves), is a morbid proceſs which muſt have preſented itſelf in every age, and with the appearances of which medical men muſt have been at all times very familiarly acquainted. The phenomena which it exhibits were denominated eroſion by Galen. Since his time, it has uſually been ſuppoſed that the ſolution of continuity which occurs in eroſion is produced by the corroſive or ſolvent power of the fluids which are generated in that proceſs.

Mr. Hunter was the firſt who ventured to call this opinion of Galen's in queſtion, and who pointed out to future obſervers the ſhare which the abſorbent veſſels have in this proceſs.

In moſt inſtances of inflammation, in which the proceſs of ulcerative abſorption occurs, it uſually begins at a ſingle point, forming a ſmall ſore or ulcer; while in other examples it commences at ſeveral points, either at the ſame time or in ſucceſſion. In many inſtances, its operation appears to be diffuſed over a conſiderable extent of ſurface; and in others again it is limited to a very narrow line, producing a chink or fiſſure, an appearance ſimilar to that which occurs in the ſeparation of mortified parts. The progreſs of ulcerative abſorption is very various in different textures, and in the ſame texture in different individuals, according to the nature of the inflammation, the degree in which it exiſts, and perhaps, alſo, according to the particular conſtitution of the perſon in whom it occurs. In ſome inſtances the proceſs of ulcerative abſorption is exceedingly ſlow, or chronic in its progreſs, the ſores which it forms remaining long open, without manifeſting any diſpoſition to extend themſelves into the parts more immediately ſurrounding them. In other inſtances it acts with great rapidity, removing and deſtroying conſiderable portions of textures or organs in the courſe of a few hours.

Dr. Thomſon then proceeds to notice, that pain of a pricking or lancinating nature is an almoſt conſtant attendant upon attacks of ulcerative abſorption; but this varies exceedingly in different textures, in different kinds of inflammation, and according as the abſorption is more rapid or ſlow.

Every organized part of the body ſeems liable to ulcerative

cerative abſorption, but we ſee it occur more frequently in cutaneous texture, and in mucous membrane, than in any of the other textures of the body.

In all the parts in which it occurs (ſays Dr. Thomſon), it is preceded by a certain degree of inflammation, and this inflammation is uſually the adheſive; but ulcerative abſorption may ſupervene in parts affected with ſuppurative or gangrenous inflammation. The inflammation which precedes and accompanies ulcerative abſorption, may be either of a ſimple or of a ſpecific nature, and great differences will be produced by this circumſtance in the appearances and effects of the ſores or ulcers which are formed.

Ulcerative abſorption, in ſimple inflammation, may ariſe from a great number of cauſes, as from preſſure upon parts in a ſtate of inflammation. We ſee this effect daily produced in caſes of ſimple and compound fractures, where the limbs are frequently kept a long while in one poſture. It may be produced by the application of irritating ſubſtances to inflamed ſurfaces, or by the too long retention of excreted fluids upon ſurfaces in a ſtate of ſuppuration.

Many ſpecific inflammations ſeem to give a diſpoſition to ulcerative abſorption, and the ſores or ulcers which are formed, are moſt of them very difficult to heal, if they are not in their nature abſolutely incurable. This difficulty is often very remarkable in ſcrophulous, ſyphilitic, cancerous, and lupous ulcerations. The ulcerative abſorption which occurs firſt in cutaneous texture, may in its progreſs be confined to that texture, removing a conſiderable portion of ſkin, and expoſing the parts which lie under it; or, without extending far along the ſurface, it may penetrate into the interior parts of the body. In doing this, it often ſucceſſively attacks and removes ſkin, cellular membrane, faſciæ, muſcle, blood-veſſel, abſorbent, nerve, and bone. We have examples of this in the progreſs of cancerous and lupous ulceration. That inflammation conſtantly precedes ulceration, Dr. Thomſon thinks is proved, not only by the occurrence of redneſs, pain, heat, and ſwelling in the parts which are contiguous to thoſe in which the ulceration appears, but alſo by that cloſure (which is effected by adheſion) of the canals of the blood-veſſels and abſorbents divided in ulcerative abſorption, and without which a certain degree of hemorrhage would be the never-failing and conſtant attendant upon the ſtate of ulceration.

When, in the healing of ſores, the ſkin which immediately ſurrounds them becomes red, hot, ſwollen, and painful, we have reaſon to dread an extenſion of the ſore by the progreſs of ulcerative abſorption. In ſome inſtances this proceſs occurs in the whole circumference, producing an extremely irritable and painful ulcer; in others, the ulcerative abſorption is confined in its operation to a particular ſpot, which is always more inflamed and painful than the other parts of the ſore. Certain ſtates and degrees of gangrenous inflammation have a tendency to terminate in ulcerative abſorption; and when the ulcerating and ſphacelating proceſſes occur together in the ſame diſeaſed ſurface, dreadful are the havock and deſtruction of parts which they occaſion. Mucous membrane, next to cutaneous texture, ſeems to be moſt liable to attacks of ulcerative abſorption. In mucous membranes, the ulcerating proceſs often appears in the form of ſmall round ſores, which are termed aphthæ when they appear in the mouth or fauces, and chancres when on the parts of generation. Theſe, like the ulcerations in cutaneous texture, may be either of a ſimple or ſpecific nature, and it is often extremely difficult, from the appearances which they exhibit, to determine to which diviſion we ought to refer them.

Bone is another texture which ſeems very liable to ulceration, and the diſorder here generally receives the appellation of caries.

Ulcerative abſorption very ſeldom begins originally in muſcle, tendon, faſcia, blood-veſſels, abſorbents, or nerves, though, in the progreſs of diſeaſe, it may attack all theſe ſtructures.

Synovial membranes are often the ſeat of ulceration, particularly in the progreſs of chronic inflammations, which attack the articulating ſurface of the joints. Here the ulcerative proceſs begins moſt frequently in the ſynovial membrane, and from this extends to the articulating cartilage, and afterwards to the bone.

Of the internal viſcera, there are none which ſeem ſo liable to ulcerative abſorption as the ſtomach and inteſtinal canal. Death is almoſt always the ſpeedy effect of ulceration, when it eats through the coats of theſe viſcera, the contents of which eſcape into the cavity of the abdomen.

Healthy pus and the appearance of granulations are always agreeable occurrences in the progreſs of an ulcer, as they indicate that a ſtop has been put, at leaſt for a time, to the proceſs of ulcerative abſorption.

It was particularly remarked by Mr. Hunter, that new-formed parts are more liable to ulcerative abſorption than ſuch as conſtitute original portions of the body. This is ſeen in the frequent abſorption of granulations, cicatrices, and callus.

There is alſo a proceſs in the animal body, very analogous to open ulceration, or, what Mr. Hunter called, ulcerative abſorption: we allude to that peculiar operation which he thought proper to name progreſſive abſorption. By this, abſceſſes, aneuriſms, and various tumours, make their way to the ſurface of the body, the parts covering them being gradually rendered thinner and thinner by abſorption. And it is by the ſame proceſs that foreign bodies, ſuch as pins, needles, bullets, &c. travel from one part of the body to another, and are at length brought to the ſurface. See Hunter's Treatiſe on the Blood, Inflammation, &c. and Thomſon's Lectures on Inflammation, p. 369, &c.

ULCEROUS *Sore-Throat.* See QUINSEY and CYNANCHE *Tonſillaris.*

ULCHUNSKOI, NIZNEI, in *Geography*, a town and fort of Ruſſia, on the Amur; 56 miles S.S.W. of Doroninſk.

ULCHUNSKOI, *Verchnei*, a fort of Ruſſia, on the Amur, on the borders of China; 100 miles S.W. of Doroninſk.

ULCI, in *Ancient Geography*, a town of Italy, in the interior of Lucania. Ptolemy.

ULEA, or ULABORG, in *Geography*, a ſea-port of Sweden, capital of a government which comprehends a part of Eaſt Bothnia, ſituated in a peninſula, at the mouth of a river of the ſame name, which runs into the gulf of Bothnia. It was built in the year 1610, and is the largeſt town in all Eaſt Bothnia. It has very ſtraight and long ſtreets, a good ſchool, a commodious harbour, and a fine ſalmon fiſhery. In the year 1714, this town was demoliſhed by the Ruſſians. The caſtle which ſtands near it on a ſmall iſland, and is properly called Ulaborg, was built and fortified in the year 1590; but now lies in a ruinous condition; 320 miles N. of Abo. N. lat. 65° 40′. E. long. 25° 23′.

ULEA, a river of Sweden, which runs into the gulf of Bothnia, N. lat. 65° 2′. E. long. 25° 22′.—Alſo, a large lake of Sweden, in the province of Cajana.

ULEASALO, a town of Sweden; 4 miles S. of Ulea.

VLED DE NUN, a country of Africa, next to the

province of Suz, or Sufe, in Morocco, and feparated from it by fandy deferts. The emperor of Morocco arrogates to himfelf the fovereignty of Vled de Nun, but his real authority is here extremely feeble. This vaft, but defert, province affords not a fingle harbour or anchoring-place along a coaft of 60 leagues, or quite to Cape Bajador. It is inhabited by different tribes of Arabs, whofe camps are fcattered over fuch parts of the interior country as are capable of cultivation. The fide next the fea is a fandy fhore, lined with rocks under water, over which the waves break violently. Ships are often driven on this coaft by rapid currents formed between the continent and the Canary iflands, and Spanifh, Englifh, and French veffels are frequently fhipwrecked. When thefe difaftrous events occur, the unhappy mariners are immediately feized and ftripped by the Arabs, expofed to every kind of privation, bought and fold, or exchanged for camels, or other beafts, in the markets of the deferts. The province of Vled de Nun has a confiderable trade. After having paffed the deferts that feparate it from Morocco, we find many tracts of land capable of cultivation, and which produce gums and excellent wax. As thefe people are fo far removed from the reach of tyranny as to live in a kind of independence, luxuries are more indulged among them; and they make ufe of many European commodities, efpecially linen. Several of thefe Arab tribes are more affable and honeft than the other Moors. They trade to Mogodor, but with referve and circumfpection, that they may not expofe their riches to the uncertainty of accident. It is probable they have a more immediate communication with the factories of Senegal, with which they may trade with lefs reftraint; and it is only by their means that the weftern Moors have any intercourfe with the people of Nigritia. If it were practicable to form fettlements on the coaft of Cape Bajador, a very profitable commerce might be eftablifhed with thefe Arabs; and mariners, who might have the misfortune to be fhipwrecked on the coaft, would be able to obtain more certain and fpeedy affiftance; but fuch a plan is expofed to too many difficulties ever to be realized. Chenier's Morocco, vol. i.

ULEMAS, the name by which the minifters and interpreters of religion are diftinguifhed in the Ottoman empire. In Turkey they poffefs the moft lucrative employments; they join judicial to religious power; they are at the fame time interpreters of religion and judges of all civil and criminal affairs; they are fecure from the extortions of the pachas and great men of the empire; they cannot be legally put to death without the confent of their chief: their property, after their deceafe, paffes as a right to their heirs, fo that the imperial treafury cannot appropriate it to itfelf. In fhort, they form a corporation, highly regarded, powerful, and fometimes formidable to the throne itfelf, from their having the direction almoft always of public opinion, and becaufe there is, perhaps, no government where public opinion is pronounced with fo much ftrength and fuccefs as in Turkey. Thefe magiftrates and doctors of the law muft not be confounded with the *imams* who ferve the mofques, (fee Imam,) nor with the *muezims*; which fee. The order of ulemas, the moft refpectable and beft informed in the Ottoman empire, comprehends the *mufti* or *muphti*, the *kadilefkers* or *cadilefchers*, the *ftambol-effendi*, and the *muderis*; which fee refpectively. The immediate minifters of religion, though they make no part of the body of ulemas, may be admitted into it, either by undergoing examinations, and getting themfelves received as muderis, or by obtaining through favour a place of provincial mufti, of cadi, or of naib. If, after having occupied thefe employments, they be admitted into the body of the muderis, and wifh to pafs to the mofque of Soliman, they may then arrive at the moft eminent places of judicature. The firft rank among them is that of *fchiek*, or preacher, whofe function is to preach in the mofques every Friday after the noon prayer, and even oftener when there are foundations for that purpofe. The fcheiks of the fourteen imperial mofques of Conftantinople are the moft confidered in the empire, and are appointed by the mufti; thofe of the other mofques are named by the magiftrate of the place or of the diftrict. The *khatibs* have no other employment befides that of difcharging, in imitation of the prophet and of the firft caliphs, and in the place of the fultan who reprefents them, the functions of *imameth*, or of the priefthood, at the folemn prayer which takes place on the Friday, and of reciting the *khoutbé*, or public profeffion refpecting the unity and the attributes of the Supreme Being, accompanied by a prayer for the prefervation and profperity of the fultan, and for the fuccefs of his arms againft the infidels. They are appointed by a *khatty-fcherif*, figned by the hand of the fultan. The imam recites in a loud voice, in the mofque, five times a day, except at the folemn Friday's prayer, the *namaz*, which the perfons prefent repeat in a low tone: he at the fame time performs the ceremonies which accompany that prayer; he affifts at circumcifion and interments: in a word, he difcharges all the functions which worfhip requires. In the early ages of Mahometanifm, *imam* fignified and defignated the pontiff, or the fupreme chief of Iflamifm: the fucceffors of the firft four caliphs took only the title of *imam-ul-muflimin*, pontiff of the Muffulmans. The doctors and interpreters of the law were afterwards decorated with it, and for fome time paft it has no longer been given to any but the minifters of religion. In moft villages, and fome mofques of the towns, whofe revenue is too limited, the imam difcharges at the fame time the functions of fchiek, khatib, imam, muezim, and cayim. The mofques of the fecond order, called *mesjids*, have no need of a khatib, becaufe they have not the right to celebrate the folemn prayer on a Friday. Olivier's Travels.

ULE-TREE, Castilla, in *Botany*, Mexican Elaftic Gum, conftitutes a new genus of plants, of which an account has been given by Don Vicente de Cervantes, in the fupplement to the *Gazeta de Literatura*, publifhed at Mexico, July 2, 1794. See Konig's Tracts relative to Botany, 229. This genus is named Castilla, in memory of the late Don Juan del Caftillo, a native of Jaca, in the kingdom of Aragon, who at the age of twenty-feven was appointed chief botanift to the royal hofpital at Porto-Rico. Seventeen years afterwards he was one of the naturalifts chofen to inveftigate the productions of Mexico, where he died July 26, 1793, at the age of forty-nine years.—Clafs and order, *Monoecia Icofandria*. Nat. Ord. *Scabridæ*, Linn. *Urticæ*, Juff.

Gen. Ch. Male, *Cal.* Perianth of one leaf, hemifpherical, covered with imbricated, ovate, acute fcales. *Cor.* none. *Stam.* Filaments numerous, thread-fhaped, inferted into the infide of the calyx, the outermoft gradually longer; anthers fimple, roundifh.

Female, on the fame branch, alternate with the male, *Cal.* as in the male, but with rather broader and thicker fcales, permanent, at length fpreading. *Cor.* none. *Pift.* Germens numerous, fifteen to twenty, ovate; ftyles two, rarely three, to each germen, fpreading, permanent; ftigmas fimple, revolute. *Peric.* Drupas from fifteen to twenty, combined at the bafe, obfcurely triangular, excavated at the fummit. *Seed.* Nut ovate, of one cell, with a kernel of the fame fhape.

Eff. Ch. Male, Calyx of one leaf, imbricated with scales. Corolla none. Stamens numerous.

Female, Calyx as in the male, permanent. Cor. none. Germens numerous. Styles two or three. Drupas numerous.

1. C. *elastica*. Cervantes as above, t. 9.—Native of the hot north-east coasts of Mexico, where it is one of the loftiest and most luxuriant of trees, much resembling *Annona muricata*. *Stem* three or four yards in circumference, very straight. *Bark* smooth, soft, three or four lines thick, ash-coloured, bitter and nauseous in taste, as is the milky juice issuing from every part when wounded. *Branches* alternate, horizontal, round, flexible; the younger ones clothed with stiff hairs. *Leaves* alternate, on short thick stalks, elliptic-oblong, acute, eighteen inches long and seven broad, veiny, downy on both sides, entire, though apparently toothed from the equidistant tufts of hair, ranged along the margin; heart-shaped at the base; reticulated with veins. *Stipulas* in pairs at the base of each footstalk, oblong, pointed, membranous, deciduous. *Flowers* axillary, solitary, nearly sessile, the male and female alternate in the lower part of each branch, but towards the end are male flowers only. *Calyx* straw-coloured. *Stamens* white, with deep-yellow *anthers*. *Drupas* larger than a pea, crowded together in the bottom of the extended calyx, orange-coloured, mucilaginous, almost tasteless.

The milky juice of this tree forms that kind of Elastic Gum, which the Mexicans call *Ule*. The *Cecropia peltata*, with some species of *Jatropha* and *Ficus*, yield a similar produce, valuable for divers economical purposes. See Caoutchouc.

ULEX, the Furze-bush, a name in Pliny, which professor Martyn is disposed to derive from οὖλος, *crisped* or *curled*; but De Theis traces the word to the Celtic *ec* or *ac*, a point, certainly applicable enough to its habit and appearance; this etymology being moreover supported by the French name of the shrub, *ajonc*, anciently *acjonc*, or prickly rush.—Linn. Gen. 379. Schreb. 488. Willd. Sp. Pl. v. 3. 969. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 756. Ait. Hort. Kew. v. 4. 265. Brot. Lusit. v. 1. 78. Juss. 352. Lamarck Illustr. t. 621. Gærtn. t. 151.—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of two ovate-oblong, concave, straight, equal, permanent leaves, rather shorter than the keel; the upper one with two teeth; lower with three. *Cor.* papilionaceous, of five petals. Standard very large, inversely heart-shaped, emarginate, straight. Wings oblong, obtuse, shorter than the standard. Keel straight, obtuse, of two petals converging at their inner margin. *Stam.* Filaments in two sets combined at the base, one simple, the other in nine divisions; anthers simple. *Pist.* Germen oblong, cylindrical, hairy; style thread-shaped, ascending; stigma small, obtuse. *Peric.* Legume oblong, turgid, nearly covered by the calyx, straight, of one cell and two elastic valves. *Seeds* few, roundish, emarginate, with a fleshy appendage.

Eff. Ch. Calyx of two leaves. Legume scarcely longer than the calyx. Stamens all connected.

The few species of this genus are almost confined to the western more temperate parts of Europe, and are remarkable for their rigid thorny bushy habit. The *leaves* are simple, small and inconspicuous. *Flowers* numerous, deep yellow.

1. U. *europæus*. Common Furze, Whin, or Gorse. Linn. Sp. Pl. 1045. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 742. Fl. Dan. t. 608. Brot. n. 1. (U. grandiflorus; Pourret Act. Tolos. v. 3. 333. Genista spinosa vulgaris; Ger. Em. 1319. Scorpius primus; Clus. Hist. v. 1. 106.)—Calyx-teeth obsolete, converging. Bracteas ovate, lax. Branches erect.—Native of gravelly or sandy heaths, in Denmark, Germany, Brabant, France, and Portugal, very frequent in England, flowering in May.—On Putney heath it is remarkably luxuriant, and very splendid when in blossom. Linnæus is recorded to have been peculiarly struck with the appearance of this shrub, when he visited England, and he complains in *Hort. Upsal.* 212, that he could never preserve it in his garden through the winter. With us it varies from two to six feet in height. The *branches* are excessively numerous, crowded, furrowed, hairy, tipped with strong, sharp, compound, permanent thorns, which bear at their base the leaves and sometimes flowers. *Leaves* solitary, awl-shaped, spinous-pointed, small, roughish or hairy, deciduous, chiefly on the youngest most vigorous branches. *Flower-stalks* axillary, solitary or in pairs, simple. *Bracteas* near the calyx, but not close-pressed, sometimes spreading, ovate, concave, silky. *Calyx* downy. *Corolla* near twice the length of the calyx, honey-scented, of a golden yellow. *Legume* downy, splitting with a crackling noise, in hot still weather.

2. U. *nanus*. Dwarf Furze. Forst. in Sym. Syn. 160. Fl. Brit. n. 2. Engl. Bot. t. 743. Willd. n. 2. Ait. n. 2. (U. europæus β; Linn. Sp. Pl. 1045. U. genistoides; Brot. n. 2. Genista aculeata minor, sive Nepa Theophrasti; Ger. Em. 1321.)—Calyx-teeth lanceolate, spreading. Bracteas minute, close-pressed. Branches reclining.—Found on rather mountainous or elevated heathy ground, in France, England, and Portugal, flowering in autumn; though it must be observed that both species are to be met with more or less in blossom, in all open weather. This is much smaller than the foregoing; *flowers* not only smaller but paler; *branches* more elongated and cylindrical; *bracteas* minute, brown; *calyx* yellower, with deeper more evident teeth.

U. capensis, Linn. Sp. Pl. 1046, being no other than *Polygala spinosa*, Linn. Sp. Pl. 989, is properly left out by Willdenow, though he ought to have referred to it under the said *Polygala*.

Ulex, in *Gardening*, furnishes shrubby plants of the thorny kind, among which the species cultivated are, the common furze, whin, or gorse (U. europæus); the dwarf furze (U. nanus); and the Cape or African berry-bearing furze (U. capensis).

The first is a well-known plant, frequently met with on wastes, commons, and heaths, spreading over large tracts of land.

There are several varieties, as the common yellow furze; the white-flowered furze; the long-spined furze; the short-spined furze; the large French furze; the small or dwarf furze; and the round-podded furze.

This sort and varieties of furze are remarkable for having all their young shoots, branches and spines of a lasting green colour, which, though they are deciduous in the leaf, which comes out in the spring, and soon falls off and disappears, yet from these numerous branches, shoots and spines remaining constantly green, they always appear in the manner of evergreens, and are mostly ranked under that head or class. See Evergreen.

The second sort is much lower than the common sort, having decumbent branches. It is found with the other kind chiefly on dry elevated heaths, but by no means so generally; flowering from August to October. It was formerly considered by some as a variety of the above.

The third, or Cape sort, has a woody hard stem, which is covered

covered with a greenish bark when young, but afterwards becomes greyish: the branches are also slender and woody. It has not yet produced any flowers in this climate.

Method of Culture.—These plants may all be increased from seeds. These in the first sort should be sown in the autumn or spring, in any light mould, where the plants are to remain. They are likewise sometimes sown in drills in nursery-beds, to be transplanted afterwards while very young; but the first is the better practice, as they do not remove well, especially when grown of a large size. Hedges of this plant are best raised by sowing them in drills an inch deep where they are to remain, keeping them perfectly free from all sorts of weeds, &c. for two or three years, until a little advanced in growth.

In the second and third sorts, in the latter of which the seed should be obtained from abroad, and be sown in pots of fine mould, plunging them in the hot-bed; when the plants are up a few inches in height, they should be removed into separate small pots, being afterwards managed as other shrubs of the greenhouse kind. But with the former, the same modes may be followed with the seeds as in the first sort and its varieties.

The last sort is difficult to raise, either by layers or cuttings.

The first sort and varieties afford ornament and variety in shrubberies, where a few plants of the different kinds may be admitted in such as are extensive, having a fine effect in their evergreen flowery appearance, and the two latter among potted plants of the greenhouse kind. The former also in borders and clumps.

ULEY, La, in *Geography*, a town of Spain, in the province of Grenada; 10 miles W. of Vera.

ULFEN, a sea-port town of Sweden, in Angermanland, on the coast of the gulf of Bothnia; 25 miles N.N.E. of Hernosand.

ULFON, *North* and *South*, two small islands on the west side of the gulf of Bothnia. N. lat. 63° 2′. E. long. 18° 27′.

ULFSBY, a town of Sweden, in the government of Abo; 5 miles S.S.E. of Biorneborg.

ULIA, (*Monte Major*,) in *Ancient Geography*, a town of Hispania, in Bœtica, towards the N.E. By a medal of Gruter, it appears to have formed a small estate, and to have assumed the title of a republic.

ULIARUS, the *isle of Oleron*, an island on the coast of Gallia Aquitanica.

VLIEGER, Simon de, in *Biography*, was born at Amsterdam about the year 1612. It is not known by whom this artist was educated, but his pictures are very deservedly esteemed for their force and brilliancy. He had the honour to be the instructor of the younger Vandevelde; and though the delicacy of the pencil enjoyed by the pupil surpassed that of the master, yet the works of the latter retain their power, and have a character of their own, which gives them a place in the best collections.

VLIELAND, or Flielant, in *Geography*, an island in the German sea, at the entrance of the Zuyder See, about eight miles long, and three in breadth; taken by the English in 1799; 5 miles N. from the Texel. N. lat. 53° 24′. E. long. 4° 25′.

ULIETEA, one of the Society islands, in the South Pacific ocean. On the east and west coasts of this island are some good harbours. One harbour or bay, called by the natives *Oopoa*, and capable of holding any number of ships, extends almost the whole length of the E. side of the island, and is defended from the sea by a reef of coral rocks; the southernmost opening in this reef, or channel into the harbour, is little more than a cable's length wide; it lies off the easternmost point of the island, and may be known by another small woody island, which lies a little to the S.E. of it, called by the people *Oatara*. Between three and four miles N.W. from this island lie two other islets, in the same direction as the reef of which they are a part, called *Opururu* and *Tamou*, between which lies another channel into the harbour, a quarter of a mile wide. Still farther to the N.W. are some small islands. On Ulietea there is a great Morai, called *Tapodeboatea*, different in its construction from the Morais of Otaheite. Several jaw-bones are found, which, like scalps among the Indians of North America, are trophies of war. On this island they exhibit dances and dramatic exhibitions for the amusement of those who choose to attend them. The inhabitants in general are more superstitious than those of Otaheite. Oreo, the chief of this island, when Cook visited it in 1774, is a native of Bolabola, but is possessed of ahenooas or lands at Ulietea, which he, as well as many of his countrymen, are supposed to have gotten at the conquest. He resides here as the lieutenant of Opoony of Bolabola, seeming to be vested with regal authority, and to be the supreme magistrate in the island. Oo-oo-rou, who is the earee by hereditary right, has little more left him than the bare title, and his own ahenooa or district, in which he is sovereign. Oreo was observed to pay him the respect due to his rank. The land is hilly, broken, and irregular, except on the sea-coast; yet the hills are green and pleasant, and in many parts abound with wood: the productions and manners of the inhabitants are similar to those of Otaheite. The principal refreshments that are to be procured at this island are plantains, cocoa-nuts, yams, hogs, and fowls: the hogs and fowls however are scarce; and the country appears to be neither so populous nor so rich in produce as Otaheite, or even Huaheine. Wood and water may also be procured here, but the water cannot be conveniently got at; lying S.W. by S. distant 7 or 8 leagues from Huaheine. See Society *Islands*.

ULIETER, or *Flie Stroom*, a road in the north part of Zuyder See, near the coast of Friesland.

ULIGINOUS Land, in *Agriculture*, a term sometimes applied to a dark-coloured sort of moist, moorish, or fenny ground or soil.

VLISSINGEN, in *Geography*. See Flushing.

ULIZIBIRRHA, in *Ancient Geography*, a town of Africa Propria, towards the S. of Adrumetum. Ptol.

ULKANSKAIA, in *Geography*, a town of Russia, in the government of Irkutsk; 60 miles S. of Kirensk.

ULKOGRUNNE, three small islands on the east side of the gulf of Bothnia. N. lat. 65° 24′. E. long. 24° 14′.

ULKOKALLA, a small island on the east side of the gulf of Bothnia. N. lat. 64° 22′. E. long. 23° 31′.

ULLA, a river of Spain, which runs into the Atlantic, N. lat. 42° 40′. W. long. 8° 25′.

ULLAGE, in *Commerce*, a term denoting what a cask of liquor wants of being full.

ULLAPOOL, in *Geography*, a sea-port town of Scotland, in the county of Ross, situated at the mouth of a river which runs into Loch Broom; it was first founded in 1788, and is advantageously situated for fishing or commerce. The roadstead is safe and convenient for any number of vessels; and there is a good quay where goods may be loaded or unloaded with the greatest ease. N. lat. 57° 52′. W. long. 5° 1′.

ULLARED, a town of Sweden, in Halland; 30 miles N. of Halmstad.

ULLAVA, a town of Sweden, in the government of Wasa; 32 miles N. of Jacobstadt.

ULLERSDORF, a town of Silesia, in the principality of Neisse; 22 miles N.N.E. of Otmuchau.

ULLERUD, a town of Sweden, in the province of Warmeland; 12 miles N. of Carlstadt.

ULLESWATER, a lake of England, situated partly in the county of Westmoreland, and partly in Cumberland, whose waters run into the Eden, by the river Eimot, 3 miles S. of Penrith.

ULLO, a small island in the North sea, near the coast of Lapland. N. lat. 69° 32′.

ULLOA, ANTONIO DI, in *Biography*, a celebrated naval officer of Spain, was born at Seville in the year 1716, and so distinguished by talents and knowledge, that at the age of eighteen years he was appointed to accompany his friend Don George Juan to South America, to co-operate with the academicians Condamine, Bouguer, and Godin, in measuring a degree of the meridian. On the 26th of May, 1735, he sailed for Peru, and remained at Quito till the measurement was completed on the 12th of May, 1744. On his return home in a French ship he was captured, in August 1745, by two English men of war, and from Louisburg, in the island of Cape Breton, whither he was carried, he proceeded to London, where he was kindly received, particularly by Martin Folkes, esq. president of the Royal Society, of which he was admitted a member in December 1746. After his arrival in Spain, he and his friend Don Juan published an account of the voyage to America, in five small folio volumes, entitled "Relacion historica del Viage de Orden de S. Mag. para medir algunos Grados de Meridiano," Mad. 1748. Translations of this work were printed, one in German, at Leipsic, and one in English, at London, in 2 vols. 8vo. 1758. Another in French, entitled "Voyage historique de l'Amerique Meridionale," Amst. 1757, 2 vols. 4to. is considered as the most complete, as the author approved the undertaking. His next object was to collect information with regard to the state of the arts and sciences, &c. in various parts of Europe, and with this view he made a tour, under the appointment of Ferdinand VI. through England, France, Holland, and various districts of Germany; and the result of this tour was that many young Spaniards were sent at the public expence to France, Holland, Geneva, and Italy, to acquire a knowledge of medicine, surgery, engraving, watch-making, and various other arts in which the Spaniards were at that time very deficient. Ulloa was also active in promoting the royal woollen manufactories, and in organizing the colleges of history and surgery; he also superintended and completed the canals and basons both at Carthagena and Ferrol. The famous quicksilver mines of Almaden were objects of his peculiar attention, and in 1759 he was deputed to visit those of Guancavellica in Peru. From this service he was removed, in 1766, to the government of Louisiana, which had been ceded to Spain, but the disturbances that ensued obliged him very soon to abandon that station. In 1776 he commanded the galleon fleet that sailed from Cadiz to Mexico, and having been charged with neglect in that service, he was honourably acquitted by a council of war at Cadiz. His second great work, which was a Physical and Historical Account of the Southern and North-eastern Part of America, and which contained a curious disquisition on the peopling of America, was published at Madrid, 4to. in 1772, under the title of "Entretenimientos Phyficos-Historicos sobre la America Meridional y Septentrional Oriental:" the disquisition is entitled "Sobre el Modo en quel passaron los primeros Pobladores." This work was translated into German by professor Diez, and published at Leipsic in 1781, 1782, in 2 vols. 8vo., and was enriched by the valuable additions of professor Schneider. Dr. Robertson estimated them so highly, that he procured a translation of them into English for his own use. Another eminent Spaniard related to the subject of this article, DON BERNARD DI ULLOA, published in 1740 an interesting work, entitled "Restablecimiento de las Fabricas y Commercio Maritimo di Espagna," which was translated into French in 1753, and which contains several extracts from the work of Don Ant. Ulloa. This latter died in the isle de Leon, near Cadiz, on the 5th of July, 1795. The Transactions of the Royal Society contain several papers which he communicated to the Society. He was a knight and commander of the order of St. Jago, lieutenant-general of the royal navy of Spain, and director-general of the Spanish marine. Gen. Biog.

ULM, in *Geography*, an imperial city of Germany, in the circle of Swabia, situated on the Danube. This city is well fortified; the magistracy and principal part of the inhabitants are Lutherans. The cathedral is one of the largest, and with respect to its Gothic tower, is esteemed one of the loftiest in Germany. N. lat. 48° 24′. E. long. 9° 59′.

ULMA, a town of Portugal, in Estremadura; 11 miles E. of Santarem.

ULMARIA, in *Botany*, so called, as Caspar Bauhin and all following writers inform us, from the shape of the leaves, though we confess ourselves unable to discover any striking resemblance therein to any kind of elm. See SPIRÆA, n. 21.

ULMEN, or *Thal Ulmen*, in *Geography*, a town of France, in the department of the Sarre; 6 miles W. of Kayser's Esch.

ULMESFELD, a town of Austria; 18 miles E. of Steyr.

ULMI, in *Ancient Geography*, a town of Pannonia. Anton. Itin.

ULMIN, in *Chemistry*, a substance obtained from the elm-tree (*ulmus*), first made known by the celebrated Klaproth, and ranked by Dr. Thomson, in his "System of Chemistry," (vol. iv. p. 69. 4th ed.) as a distinct vegetable principle, on account of its peculiar and extraordinary qualities. This very intelligent chemist observes, that though in its original state it is easily soluble in water, and wholly insoluble in alcohol and ether, it changes, when nitric or oxymuriatic acid is poured into its solution, into a resinous substance, no longer soluble in water, but soluble in alcohol; and this singular alteration is attributed to its union with a small portion of oxygen, which it has acquired from these acids. It has been the subject of Mr. Smithson's particular examination, and he has observed facts which appear to warrant a different history of its phenomena, and opinion of its nature, from that which has been given of them. The ulmin used in his experiments had been freed from the fragments of bark by solution in water and filtration, and recovered in a dry state by the evaporation of the solution in a water-bath. In lumps, says this ingenious writer, ulmin appears black, but in thin pieces it is transparent, and of a deep red colour. In a dilute state, solution of ulmin is yellow; in a concentrated one, dark red, and not unlike blood. When this solution dries, the ulmin separates into long narrow strips, arranged in rays towards the centre, which curl up, and detach themselves from the vessel, and the fluid part seems to draw together and become protuberant. The solution feebly and slowly restores the colour of turnsole paper reddened by an acid.

If dilute nitric acid be poured into a solution of ulmin, a copious precipitate is immediately formed. When the mixture is thrown on a filter, the matter supposed to be a resin remained on the paper, and a clear yellow liquor passed

 through

through it; which yellow ſolution, on evaporation, produced a number of priſmatic cryſtals, having the appearance of nitrate of potaſh; and theſe were tinged yellow by ſome of the reſin. The mixture, heated in a gold diſh, deflagrated with violence, and left a large quantity of fixed alkali. Similar reſults were obtained by means of dilute muriatic acid. The filtered liquor afforded ſaline matter, which being freed by ignition from a portion of diſſolved reſin, ſhot into pure white cubes of muriate of potaſh. A ſimilar precipitation was effected by ſulphuric, phoſphoric, oxalic, tartaric, and citric acids, in ſolution of ulmin. Diſtilled vinegar produced no turbidneſs, but the mixture, exhaled to dryneſs, at a gentle heat, was found to be again wholly ſoluble in water; and when it boiled, ſome decompoſition occurred. On adding muriatic acid to a mixture of ſolution of ulmin and diſtilled vinegar, a precipitate was produced, as in an aqueous ſolution. The nitric and muriatic acids received from the ulmin a ſmall quantity of lime and iron, and, as was ſuppoſed, of magneſia; which were conceived to be foreign admixtures. Some experiments were made in order to detect the quantity of potaſh in ulmin. When four grains of this ſubſtance were decompoſed by nitric acid, 2.4 grains of reſin-like matter were the reſult; and when the nitrate of potaſh obtained was heated to deflagration, in a platina crucible to free it from reſin, the alkali produced was ſuperſaturated with nitric acid, dried, and ſlightly fuſed; it then weighed 1.2 grain: ſo that if we admit $\frac{1}{2}$ of nitrate of potaſh to be alkali, this will denote $\frac{14}{100}$ of potaſh in ulmin. By decompoſing five grains of ulmin by muriatic acid, the reſinous matter weighed 3.3 grains; and the muriate of potaſh, ignited, ſeparated from the charcoal, dried, and again made red-hot, weighed 1.4 grain. Suppoſing $\frac{3}{5}$ of muriate of potaſh to be alkali, we may infer that the ulmin had $\frac{14}{100}$. Two grains of ulmin were made red-hot in a gold crucible; and it then weighed only 1.05 grain. The flakes, retaining their form, appear to have acquired the blue and yellow colours of heated ſteel, with the metallic aſpect and luſtre; but the metallic appearance was immediately deſtroyed by water. Muriatic acid poured on, cauſed a ſtrong effervescence, and formed muriate of potaſh, which freed from charcoal, and made red-hot, weighed 0.6 grain, correſponding to $\frac{20}{100}$ of potaſh in ulmin. From theſe experiments our author infers, that the quantity of potaſh in ulmin is about $\frac{1}{5}$.

The ſubſtance ſeparated from ulmin by acids has the following qualities: it is gloſſy, and appears reſinous: in lumps it appears black, in minute fragments tranſparent, and of a garnet-red colour: it burns with flame, and is reduced to white aſhes: alcohol diſſolves it in a very ſmall quantity, which is alſo the caſe with water: acids cauſe a precipitate on the ſolution, though the reſin-like matter appears neither to contain any alkali, nor to retain any of the acid: its watery ſolution ſeems to redden turnſole paper: neither ammonia nor carbonate of ſoda promotes its ſolution in cold water: on adding a ſmall quantity of potaſh to water, it diſſolves immediately and abundantly. Upon the whole, it appears that ulmin is not a ſimple vegetable principle of anomalous qualities, but a combination with potaſh of a red, or more properly, a high yellow matter, which, if not of a peculiar genus, ſeems rather more related to the extractives than to the reſins.

Our author made ſeveral experiments with a black ſhining ſubſtance, appearing like ulmin, collected from an elm-tree in Kenſington gardens; and found that it differs in a variety of reſpects from that which he obtained from Palermo. The Engliſh ulmin had an exceſs of alkali, which he ſuppoſes to be owing to the tree from which it was collected having been affected with the diſeaſe which produces the alkaline ulcer to which the elm is ſubject. Ulmin, he ſays, appears to be the product of old trees. The uſes to which it is applicable, as an aſtringent, are ſtill to be inveſtigated. See Phil. Tranſ. for 1813, pt. 1.

ULMUS, in *Botany*, an old Latin name, generally left by etymologiſts unexplained, but deduced by De Theis from Elm, its ſynonym in Angio-Saxon, as well as in all the dialects of the Celtic tongue; and which has remained unchanged in Engliſh to this day.—Linn. Gen. 123. Schreb. 173. Willd. Sp. Pl. v. 1. 1324. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 281. Prodr. Fl. Græc. Sibth. v. 1. 171. Ait. Hort. Kew. v. 2. 107. Purſh 199. Juſſ. 408. Tourn. t. 372. Lamarck Dict. v. 4. 609. Illuſtr. t. 185. Gærtn. t. 49.—Claſs and order, *Pentandria Digynia*. Nat. Ord. *Scabridæ*, Linn. *Amentaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, turbinate, corrugated; its limb four or five-cleft, erect, internally coloured, permanent. *Cor.* none. *Stam.* Filaments four or five, awl-ſhaped, twice the length of the calyx; anthers erect, ſhort, with four furrows. *Piſt.* Germen orbicular, compreſſed, erect, ſomewhat ſtalked; ſtyles two, ſhorter than the ſtamens, reflexed; ſtigmas downy. *Peric.* Capſule membranous, large, oval, compreſſed, winged, with the dilated ſtyles, of one cell, not burſting. *Seed* ſolitary, roundiſh, ſlightly compreſſed.

Eſſ. Ch. Calyx four or five-cleft, inferior, permanent. Corolla none. Capſule membranous, compreſſed, nearly flat, with one ſeed.

Obſ. The flowers in ſome ſpecies have only four ſegments and four ſtamens, in ſome occaſionally ſix. Schkuhr is ſaid to have met with eight ſtamens, which Willdenow confirms. The pericarp was called by Linnæus ſometimes a dry *drupa*, ſometimes a dry *berry*. Schreber adopted the latter. In more modern language it is a SAMARA; ſee that article.

The ſpecies of *Ulmus* have not been well defined. Linnæus confounded all the European ones together, under the name of *U. campeſtris*. The writer of this has diſtinguiſhed five Britiſh ſpecies in his Engl. Bot., and Compendium, ed. 2. More may perhaps be made out hereafter. Characters formerly ſuppoſed accidental, ſuch as the number of ſtamens and ſegments of the flower, have been found permanently to indicate a ſpecific difference; and the different value of the ſeveral ſpecies, for ornamental planting, or for timber, renders their diſcrimination important. They are generally *trees* of lofty ſtature, with hard and tough wood; ſtalked, alternate, roughiſh *leaves*; and numerous, tufted, ſmall, reddiſh or purpliſh, very early *flowers*, fading long before the foliage expands. The *capſules* are deciduous, copious, of a light chaffy aſpect, ſcarcely ever perfecting their *ſeed*, at leaſt in England.

1. U. *campeſtris*. Common Elm. Linn. Sp. Pl. 327. Bauh. Pin. 426? Fl. Brit. n. 1, α. Compend. 42. Engl. Bot. t. 1886, excluding the reference to Willdenow and Ehrhart. (U. minor, folio anguſto ſcabro; Goodyer in Ger. Em. 1480. Raii Syn. 469. U. ſuberoſa α; Dryandr. in Ait. n. 2.)—Leaves doubly ſerrated, rough, unequal at the baſe. Flowers nearly ſeſſile, four-cleft, with four ſtamens. Fruit oblong, naked.—Common in ſcattered woods and hedges, chiefly in the ſouthern part of England, flowering in April, ſcattering its unprolific ſeeds in June. The tree attains a conſiderable height before it bloſſoms, with a rugged crooked trunk and branches, being of ſlower growth than our other wild ſpecies, with a harder, more durable, and conſequently more valuable, wood, which is preferred for coffins, as reſiſting wet for a long while. *Leaves* on ſhort ſtalks, ovate, ſomewhat rhomboid, unequal at the baſe, doubly

doubly ferrated, rough on both fides; moft downy beneath, efpecially at the axillary glands of their veins: their length is from one to two inches, fcarcely more. *Footftalks* fhort. *Flowers* from feparate, much more early, buds, in numerous, denfe, round tufts, almoft feffile, with oblong fringed *bracteas*. *Calyx* light red, in four ovate, obtufe, equal, fringed fegments. *Stamens* four, oppofite to each fegment, fmooth, with large purple *anthers*. *Stigmas* downy along their upper edge; at length dilated at the other, incurved, and running down into the membranous fmooth wings of the *capfule*, whofe oblong wedge-like fhape effentially diftinguifhes this fpecies from the next.—Whether this be Schkuhr's *U. tetrandra*, we have no means of knowing. It is certainly very erroneoufly combined with *fuberofa* in Hort. Kew. Linnæus doubtlefs confounded it with *montana*; but the latter name having been long eftablifhed, we prefer retaining *campeftris* for the prefent fpecies, authors having made fo many miftakes, that no name can be chofen which fome authority or other does not contradict.

2. U. *fuberofa*. Cork-barked Elm. Ehrh. Arb. 142. Willd. n. 2. Engl. Bot. t. 2161. Compend. 42. Ait. n. 2, *β*. (U. campeftris *β*; Fl. Brit. n. 1. Hudf. 109. U. vulgatiffima, folio lato fcabro; Goodyer in Ger. Em. 1480. Raii Syn. 468.)—Leaves pointed, doubly and fharply ferrated, rough, unequal at the bafe. Flowers on fhort ftalks, four or five-cleft, with four or five ftamens. Fruit rounded, deeply cloven, naked. Bark corky.—Found in woods, and about villages, in many parts of Europe. Very common in Suffex, according to Mr. Borrer, flowering in March. The *branches* fpread widely, and their bark of a year old is covered with a fine denfe cork, divided by deep fiffures. *Leaves* larger than in the foregoing, more pointed, as well as more fharply and finely ferrated. *Flowers* earlier, more hairy, on longer ftalks, and often five-cleft; their fegments obtufe. *Capfule* much fhorter and nearly orbicular, more deeply cloven than in *montana*, to which fpecies the prefent feems more akin than to *campeftris*. The axillary tufts of hair to the veins beneath, are peculiarly broad in *U. fuberofa*.

3. U. *major*. Dutch Elm. Engl. Bot. t. 2542. Compend. 43. (U. hollandicus; Mill. Dict. ed. 8. n. 5. U. major hollandica, anguftis et magis acuminatis famaris, folio latiffimo fcabro; Pluk. Alm. 393.)—Leaves unequally, rather bluntly, ferrated, rough, unequal at the bafe. Flowers nearly feffile, four-cleft, with four ftamens. Fruit obovate, naked, flightly cloven.—Native of Holland, and perhaps of England. We believe it may not be fpecifically diftinct from what was pointed out to us by his grace the duke of Bedford, near Shugborough, Staffordfhire, by the name of the Huntingdonfhire Elm, but of that we have not feen either *flowers* or *fruit*. We originally confounded the *U. major* with *fuberofa*, and this may have led to the ftill greater miftake in Hort. Kew. of uniting our *campeftris* to the Dutch Elm, though the wood of the former is mentioned in Engl. Bot. as the moft valuable of its genus, while that of the latter is declared by Miller to be "good for nothing." This author fays his *U. hollandicus* was brought from Holland in king William's reign, and being recommended for its quick growth, was a fafhionable tree for hedges in gardens, but afterwards fell into difufe. We prefer for this fpecies the name of *major*, taken from Plukenet's fynonym. It is intermediate between *fuberofa* and *montana*, agreeing moft with the latter in its broad, bluntly-ferrated rough *leaves*, and the large obovate *fruit*, which is much lefs deeply cloven than in *fuberofa*. The *branches* fpread widely, in a drooping manner, and their bark is more corky than even that of the fpecies laft mentioned.

4. U. *montana*. Broad-leaved Elm, or Wych Hazel. Bauh. Pin. 427. Camer. Epit. 70. With. 279. Fl. Brit. n. 2. Engl. Bot. t. 1887. (U. campeftris; Willd. n. 1. Ait. n. 1. Woodv. Med. Bot. t. 197. Sm. Prodr. Fl. Græc. Sibth. n. 599? Fl. Dan. t. 632. U. nuda; Ehrh. Arb. n. 62. U. folio latiffimo fcabro; Goodyer in Ger. Em. 1481.)—Leaves doubly ferrated, pointed, rough, unequal at the bafe. Flowers on fhort ftalks, five or fix-cleft, with five or fix ftamens. Fruit rounded, naked, fcarcely cloven.—This appears to be one of the moft common fpecies throughout Europe, from the fouth of Sweden. It is frequent in woods and hedges in Britain, flowering at the end of March, or early in April, and ripening feed, more perfectly than our firft fpecies, in June. The *tree* is large and fpreading, with drooping or pendulous *branches*. The wood fetches about half the price of our Norfolk *campeftris*. The *bark* is not corky. *Leaves* much larger than in *campeftris*, and fomewhat lefs rough, with longer points. *Flowers* larger, on rather longer ftalks, their fegments acute, from five to fix, or even feven, with the fame number of *ftamens*. *Fruit* larger, more orbicular, flightly obovate, fmooth at the edge, and very flightly cloven at the end.—Since the fpecies of Elms have been more accurately inveftigated, botanifts have differed about the names of this and our firft defcribed. That the prefent is *U. montana* of Bauhin, fo well figured by Camerarius, and diftinguifhed from what thofe authors term *campeftris*, there can be no doubt. The latter is the *Ulmus* figured by Matthiolus, Dodonæus, Lobel (in his Icones, v. 2. 189.), with a fort of gall, but no fructification, and we prefume it to be either our *campeftris* or *fuberofa*, but moft probably the former. However this part of the queftion may be decided, we conceive there can be no doubt as to the *montana*, which can never be juftly taken for the true *campeftris*, though confounded by Linnæus with other fpecies under that name, and though it may be the Swedifh plant. Both perhaps are indigenous in Greece, but we have no fpecimens from thence.

5. U. *glabra*. Smooth-leaved, or Wych Elm. Mill. Dict. ed. 8. n. 4. Cullum Fl. Angl. 97, unpublifhed. Sm. Compend. 43. Engl. Bot. t. 2248. (U. montana *β*; Fl. Brit. n. 2. U. folio glabro; Ger. Em. 1481. Raii Syn. 469.)—Leaves doubly ferrated, fmooth, unequal at the bafe. Flowers nearly feffile, five-cleft, with five ftamens. Fruit obovate, naked, deeply cloven.—Native of England. Obferved by Mr. Edward Forfter to be the moft abundant fpecies of this genus in fome parts of Effex, flowering in March. We have arranged Gerard's fynonyms of this and the firft two fpecies, under the aufpices of that accurate Britifh botanift. The prefent is an elegant *tree*, with fpreading drooping *branches*, whofe bark is fmooth and blackifh. *Leaves* more oblong and rigid than thofe of *fuberofa*, very unequal at the bafe; quite fmooth to the touch on the upper fide, and nearly fo beneath, except the general downinefs of the rib and veins. *Flowers* fringed, obtufe, with long *ftamens*. *Fruit* fmall, cloven down to the feed. Goodyer in Gerarde's Herbal fays the wood is preferred for the naves of cart-wheels. If fo, it perhaps equals our *campeftris* in quality.

6. U. *effufa*. Loofe-flowering Elm. Willd. n. 3, with many wrong fynonyms. (U. ciliata; Ehrh. Arb. 72. U. pedunculata; Lamarck n. 2. U. folio latiffimo, floribus in petiolis (pedunculis) pendentibus; Buxb. Halenf. 340. U. longioribus florum et feminum petiolis; Rupp. Jen. ed. Haller. 330.)—Leaves doubly ferrated, fmooth, unequal at the bafe. Flowers octandrous, on drooping ftalks. Fruit elliptical, cloven, denfely fringed.—Native of Germany. Buxbaum fpeaks of it as growing about villages,

lages, affording a grateful ſhade. Ruppius gathered it near Leipſic, and Ehrhart at Hanover. We know nothing of this ſpecies in England. Its *leaves* are larger than the laſt, and not leſs unequal at the baſe; very ſmooth, with downy ribs and footſtalks. *Flower-ſtalks* about an inch long, ſmooth, looſely pendulous. *Calyx* probably anſwering in its ſegments to the number of the *ſtamens*, which are ſaid to be eight, but we do not always find the *calyx* more than five or ſix-cleft, with blunt ſhallow diviſions. The *fruit* is elliptical, acute at each end, larger than the laſt, cloven, but not quite down to the ſeed; its margin denſely woolly; by which laſt mark, and the long drooping *flower-ſtalks*, this ſpecies is very clearly diſtinguiſhed. We cannot concur with Willdenow in thinking this *U. glabra* of Miller, or *montana* of Bauhin; it certainly does not anſwer to the cut of *montana* in Camerarius.

7. U. *americana*. American Elm. Linn. Sp. Pl. 327. Willd. n. 4. Ait. n. 3. Purſh n. 1.—Leaves acutely ſerrated, very rough, ſomewhat unequal at the baſe. Flowers on longiſh ſtalks. Fruit ovate, deeply cloven, denſely fringed. Common in all low lands and woods, from New England to Carolina, flowering in April, and known by the name of White Elm. *Purſh*. There is a variety with red branches, another with white, and a third more pendulous, whoſe *leaves* are ſaid to be ſmoother. In our ſpecimens the *leaves* are large, long-pointed, unequally ſerrated, more or leſs rough, like a file, on ſhort downy ſtalks; their ribs numerous, ſtraight and parallel; their under ſide downy and hoary when young. *Stipulas* long, ſtrap-ſhaped, reddiſh, deciduous, ſmooth. *Stamens* apparently more than five. *Fruit* reticulated, as denſely fringed as the laſt, and more deeply cloven.

8. U. *nemoralis*. Hornbeam-leaved Elm. River Elm. Ait. n. 4. Willd. n. 5. Purſh n. 2. (U. polyama; Lamarck n. 5. Rhamnus carpinifolius; Pallas Roſſ. v. 1. part 2. 24. t. 60. Planera Gmelini; Michaux Boreal.-Amer. v. 2. 248. P. aquatica; Willd. Sp. Pl. v. 4. 967. Purſh 115. P. Richardi; Michaux ibid.?)—Leaves ovate, oblong, equally ſerrated, nearly ſmooth; ſcarcely unequal at the baſe; paler beneath. Fruit inflated, oblique.—Native of the banks of rivers in North America, flowering in April and May. Pallas found it in Siberia, and was juſtly doubtful of its genus. This tree is ſaid to have been cultivated by the late Mr. Gordon, in 1760. It flowered in the royal French garden at Trianon, for the firſt time, in April 1779. The ſynonyms appear very paradoxical, and we hardly feel juſtified in ſuppoſing that Michaux as well as Purſh, have each deſcribed the plant twice over. Yet we never could meet with more than one ſpecies anſwerable to the above names. The *tree* is tall and handſome, with a white brittle wood. *Leaves* an inch and a half long, bright green, with large, broad, blunt, equal ſerratures. *Footſtalks* downy, very ſhort. *Flowers* nearly ſeſſile, in lateral or axillary tufts, ſome of them occaſionally male or female only. *Calyx* bell-ſhaped, uſually five-cleft, with five *ſtamens*. *Capſule* ovate, oblique, gibbous, reticulated, bordered, not winged, very unlike an *Ulmus*, yet ſurely leſs like a *Rhamnus*, or a *Celtis*, to both of which it has been compared. Not having ſeen the fructification alive, to trace its progreſs, we muſt leave the genus of this remarkable tree in the uncertainty in which we find it.

9. U. *Abelicea*. Sandal-wood Elm. Sm. Prodr. Fl. Græc. Sibth. n. 600. (Abelicea cretica; Pon. Bald. 112, with a figure. Sm. Tr. of Linn. Soc. v. 9. 126. Bauh. Hiſt. v. 1. 490. Pſeudoſantalum creticum; Bauh. Pin. 393.)—Leaves elliptical, equally ſerrated, ſcarcely unequal at the baſe; downy and hoary beneath. Fruit inflated, oblique.—Native of Crete, from whence its wood is ſaid to have been formerly tranſported to Italy, as a ſort of Sandal-wood. Honorio Belli communicated a figure of the *branches* and *leaves* to Pona, and we have the fruit from Dr. Sibthorp, but no ſpecimen or account of the *flowers*. This ſpecies differs from the laſt chiefly in the hoary pubeſcence of its *leaves* on their under ſide. The *fruit* is very ſimilar to that, but more compreſſed, and cloven like an Elm at the ſummit. The *wood* is harder, and reddiſh.

10. U. *fulva*. Red, or Slippery, Elm. Michaux Boreal.-Amer. v. 1. 172. Purſh n. 3. — Branches rough. Leaves ovate-oblong, pointed, unequally ſerrated, very rough, downy on both ſides; ſcarcely unequal at the baſe. Buds denſely woolly. Flowers ſeſſile.—On mountains, from Canada to Pennſylvania, flowering in May. The viſcid inner bark is uſed by the natives as a healing application for fores. *Purſh*. *Leaves* variable in ſhape and ſerratures, but more downy than thoſe of other American Elms. *Stamens* from five to ſeven. *Stigmas* purpliſh. Young *fruit* downy on both ſides. *Michaux*.

11. U. *alata*. Whahoo, or Cork-winged Elm. Michaux Boreal.-Amer. v. 1. 173. Purſh n. 4.—Branches winged with cork at each ſide. Leaves oblong-oval, tapering to a point; nearly equal at the baſe. Fruit downy, denſely fringed. — In ſandy low woods of Virginia and Carolina, flowering in April. *Purſh*. A middle-ſized *tree*, with *leaves* like horn-beam, and nearly the *fructification* of *U. americana*. *Michaux*. This is the *U. pumila* of Walter, Fl. Carolin. 111.

12. U. *pumila*. Dwarf Elm. Linn. Sp. Pl. 327. Willd. n. 6. Ait. n. 5. Pall. Roſſ. v. 1. part 1. 76. t. 48. (U. humilis; Amm. Ruth. 180.) — Leaves elliptic-lanceolate, equally ſerrated, very ſmooth; nearly equal at the baſe. Fruit roundiſh-ovate, cloven, ſmooth.—Native of Siberia and China. Hardy in England. A buſhy *ſhrub*, with ſhining, veiny, neatly ſerrated *leaves*, ſmaller than in any of the former, except perhaps *U. Abelicea*. *Flowers* ſtalked, red.

13. U. *integrifolia*. Entire-leaved Elm. Roxb. Coromand. v. 1. 56. t. 78. Willd. n. 7. — Leaves entire. Fruit orbicular, emarginate.—Native of the Circar mountains of the Eaſt Indies, flowering during the cold ſeaſon, and caſting its leaves after the rainy ſeaſon, but young ones come out in March. This is a large timber *tree*, whoſe wood ſerves for a variety of uſes. The ovate, acute, entire *leaves* are near three inches long. *Flowers* ſmall, ſeſſile, deeply five-cleft; ſome of them male, with eight *ſtamens*; the reſt with five. *Fruit* ſomewhat racemoſe, veiny, near an inch broad.

Ulmus, in *Gardening*, contains plants of the deciduous timber-tree and ornamental hedge-kind, and others, among which the ſpecies cultivated are, the common elm (U. campeſtris); the Dutch elm (U. ſuberoſa); the broad-leaved elm, or Wych hazel (U. montana); the American elm (U. americana); the hornbeam-leaved elm (U. nemoralis); and the dwarf elm (U. pumila).

The firſt ſort grows to a great high tree; the bark of which in the young trees and the boughs of the older ones is ſmooth and very tough, and will ſtrip or peel from the wood a great length without breaking, being ſomewhat of an aſtringent quality, and probably capable of being employed in the buſineſs of tanning leather.

There is a variety called the narrow-leaved elm, which is like the other, but much leſs and lower: the leaves are uſually about two inches and a half long, and an inch or an inch and quarter broad; indented about the edges, and having one ſide longer than the other, and being harſh on both ſides

fides like the other. It is called in the nurferies the Englifh elm. It is ftated by Dr. (now fir James) Smith, as the opinion of Mr. Crowe, that this is the origin of all the cultivated varieties of the elm: and Miller afferts that there are feveral other varieties, but not worth noticing; among thefe is that with variegated or blotched leaves. Gilpin alfo makes mention of the weeping elm.

However, the varieties commonly noticed are, the common fmall-leaved Englifh elm; the larger rough-leaved Englifh elm; the fmall-leaved Cornifh elm; the fmooth-barked or Wych elm; the narrow-leaved Wych or Scotch elm; the broad-leaved Wych elm; the fmooth-leaved Wych elm; the rough-leaved Dutch elm, with large leaves; the yellow or golden-ftriped leaved elm; the filver-ftriped elm; and the filver-dufted elm.

The fecond fpecies is chiefly remarkable for its quick growth and fungous rough bark. It is a native of Europe, and is often called the cork-barked or the Dutch elm, as it was introduced from Holland at the beginning of king William's reign: the wood is of very inferior quality.

The third fort has the bark of the branchlets fmooth and even: the bark on the outfide in this is blacker than in that of the firft kind, and is alfo very tough; fo that when there is plenty of fap, it will ftrip or peel from the wood of the boughs from one end to the other, a dozen feet in length, or more, without breaking: the timber is in colour nearly like the firft: it is not fo firm or ftrong for naves of wheels, but will more eafily cleave: the branches or young boughs are groffer and bigger, and fpread themfelves broader, and hang more downwards; the leaves being much broader and longer than in any of the other kinds of elm.

The variety of it termed the fmooth-leaved elm is in bignefs and height like the firft, but the boughs grow as thofe of the Wych hazel, hanging more downwards than thofe of the common elm: the bark is blacker than that of the firft kind, but will alfo peel from the boughs: the flowers and feeds are like thofe of the firft; the leaves alfo, in form, are like that, but fmooth in handling on both fides: the wood is faid to be more defired for naves of cart-wheels than that of the firft fort.

The fourth kind has three varieties, according to the Kew catalogue: the firft is the red, or Canada elm, which grows in its native country to a vaft fize; the leaves are ovate, wrinkled, and fcabrous, broader than thofe of our Dutch or Wych elms, fmoother, and of a much more lively green; the branches are red, whence it has the name of red elm. It grows very faft in this climate.

In the fecond variety, or the white elm, which is fo named from the whitenefs of the branches, the leaves are fcabrous, but oblong; and, according to Gronovius, having narrower leaves than the red, and the trunk befet at intervals with twigs clofely cluftered together below the boughs. Boats are faid to be made from the bark of it.

The third, or the drooping or weeping variety of this fort of elm, is diftinguifhed by its oblong fmoothifh leaves, and its pendent branches. Martyn obferves that the American fort differs from the European elm, in having the leaves equally, or, as Gronovius expreffes it, quite fimply or fingly ferrate.

The fifth fort, or the hornbeam-leaved elm, is a North American fort of elm.

The laft fort has the branches more flender than in the other kinds, divaricating, and of a greyifh afh-colour: the wood is very hard and tough, grey, remarkably waved with tranfverfe lines of a deeper colour, larger fibred, and when expofed to the air becomes yellower than oak, and is preferable to it: the afhes exported from Riga, under the name of waidafche, are made entirely from the wood of this and other elms, burnt in brick-furnaces: the root is beautifully variegated, and fit for the ufe of the turner, &c.: the bark does not readily peel off, and therefore is not ufed for making ropes. It is faid, in Southern Ruffia, to often contend with the oak in ftature.

There is a variety with both young and old branches winged and rendered irregular with compreffed fungous excrefcences of the bark varioufly interrupted; and in mountain rocks there is a variety which has fhorter thicker branches, winged with fungous excrefcences of the bark.

Method of Culture.—In thefe trees it is effected in different ways; as by feed, fuckers, layers, and grafting. The feed, when perfectly ripened, may be collected and fown in the autumn or fpring, in four-feet wide beds, half an inch deep; that which is kept to the fpring being preferved by drying it well, out of the fun, then putting it up clofe till towards autumn, when it fhould be mixed with fand, to preferve it more effectually through the winter; when about the middle of February it fhould be fown as above. The young plants fhould afterwards be carefully fhaded, watered, and kept clear from weeds. They fhould have one or two years growth in the feed-bed, and then be planted out in nurfery lines, in rows two or three feet afunder, and the plants fifteen or eighteen inches diftant in each row, giving them the common nurfery care, and training them for the purpofes intended. If for ftandards, for timber, or ornamental plantations, they fhould be trained each to a fingle ftem, and as they advance in height, clearing the ftems from all lateral fhoots, leaving only the very fmall twigs, juft to draw and detain the fap, for the better increafe of the ftem; fuffering the leading top-fhoot to remain entire, as alfo the principal branches of the head; but thofe defigned for hedge-work, &c. fhould be let branch out all the way, and become feathered to the bottom, or as low as may be requifite for the purpofes intended, only trimming them occafionally with the knife or garden-fhears, to give them the intended form. When the trees have had four or five years' growth, and are from four or five, to fix, eight, or ten feet high, they are fit for planting out where they are to remain.

The feed method of raifing the plants is the beft practifed with the Wych elm forts, as they ripen their feeds better than the other kinds, during the fpring and fummer months; but when it can be obtained of a good quality from the other forts, it may be ufed in the fame way with equal fuccefs.

The fuckers which moft of the forts fend up from the roots, but efpecially the Englifh and Dutch forts, fhould be taken up carefully with root-fibres, in autumn, winter, or fpring, trimming them for planting by cutting them down at top to fix or eight inches, placing them in fmall trenches or drills five or fix inches deep, one row in each, half a foot apart, and the drills about half a yard afunder; giving waterings in fpring and fummer; letting them remain two years, to form good roots, then planting them in wide nurfery-rows, and managing them as directed for the feedlings.

The layers of all the forts may eafily be made by previoufly preparing a quantity of ftools to produce fhoots, fituated near the ground: the proper feafon for laying them down is in the autumn, winter, or early in the fpring, performing it by flit-laying; and as foon as the whole are laid and moulded in, every layer fhould be lopped with a knife, down

down to one eye above the ground. In this way they readily take root in the ſpring and ſummer following, ſhooting at top ſometimes two or three feet long by the autumn, when they ſhould be detached from the ſtools, and be planted in nurſery-rows, two feet or a yard aſunder, and half a yard diſtant in the rows: when they begin to ſhoot, they ſhould be trained with one leading ſhoot only, as the ſeedling elms, managing them in the ſame manner.

In the grafting method, all the varieties of elms may be increaſed and continued diſtinct, which ſhould be done upon ſtocks of the Wych elm, raiſed from ſeed, ſuckers, or layers, though the ſeedling ſtocks are preferable. For which purpoſe, ſome rows of Wych elms ſhould be allotted for ſtocks, which, after having two years' growth in the nurſery lines, will be fit to graft on: when about the beginning of February, the cuttings of the young moderate ſhoots of the beſt Engliſh elm, or any other variety, ſhould be inſerted into the ſtocks by the method of whip-grafting, putting them in as low as poſſible, for which the earth ſhould be removed away a little down to each root, then cutting off the head of the ſtock within two or three inches of the bottom; the grafts be inſerted one in each ſtock, as above, binding them cloſe, and claying them well; then drawing the earth up about and over the clay, the more effectually to ſecure it from falling off by the effects of the froſt or other cauſes. When they begin to ſhoot, they ſhould be trained with only one leading ſhoot, ſo that if they fork at top into two or more, the weakeſt ſhould be taken off, leaving the beſt ſhoot for the leader, diſplacing all large ſide-ſhoots from the ſtems, and letting the tops or leading ſhoots remain always entire, as alſo the general upper branches of the heads.

It has been obſerved, that as the common elm produces no ſeeds in this country, it is beſt propagated by ſuckers, or cultivated by grafting. In the firſt caſe, when the old tree is cut down, or the roots wounded by any accident, young ſhoots are thrown out in great abundance. The raiſing of elms by layers is adviſed by ſome as better than by ſuckers, which it is ſaid are more liable to breed ſuckers, and of courſe to injure the trees, and encumber the ground around them. Such ſtatements are not, however, exactly true, as there are no better trees than thoſe raiſed by ſuckers, when it is properly performed, and they are placed for two or three years in a good nurſery-ground. Young trees growing as ſuckers, without tranſplanting, certainly breed and ſend up new ones, as they ſpring up from long horizontal roots, which being bruiſed by accident, or otherwiſe wounded, will, in all ſuch places, throw up new plants; but if the young trees be cut and ſeparated from ſuch roots, and then planted out in good ſoils, they ſpeedily become flouriſhing, and grow exactly in the ſame manner the larger trees grow.

On the examination of theſe roots, no deficiency will be found, it is aſſerted; but the caſe is widely different if the young trees remain attached to the parent roots, the decay in the ſtumps of which communicates with the young trees; and this is the reaſon, it is ſuppoſed, why ſo much of the hedge-row elm-timber in ſome places falls in an unſound ſtate. Although apparently flouriſhing in the lower parts of the ſtocks, they all grow from ſuckers, which convey the rot from the parent to the offspring; and it is a rare thing, in ſome diſtricts, to find two ſound elms together that have ſprung up ſpontaneouſly; though it is equally uncommon to find a planted tree unſound at the bottom. The plants, in all expoſed ſituations, ſhould be put down ſmall and flouriſhing, being free from any ſort of former check, as ſuch plants anſwer the beſt in all caſes.

In order to prevent the above danger, the young plants ſhould be early ſevered from the parent roots or trees; they will then almoſt immediately ſend down perpendicular roots into the ſoil, take firm hold of the ground, and become independent trees.

As the ſtumps of old trees decay in a few years, they become a ſort of bowls filled with rain-water, which not only rots theſe ſtumps, and penetrates and deſtroys the interior of thoſe roots that formerly nouriſhed the trees, but which actually aſcends the ſtems of the young elm-plants, that ſpring from ſuch roots. It is contended, that in ſpite of luxuriant foliage and a clean bark, it will be found on the inſpection of any plant ſo produced, that the miſchief has already begun, which grows with its growth, and ſtrengthens with its ſtrength, until the tree becomes fit for felling. Specimens of ſuckers from decaying ſtumps, not an inch in diameter, have been met with and preſerved, in which the heart was already injured; and this will continue, it is ſaid, to increaſe, until the channel of communication is cut off. After ſeparation the evil does not increaſe, as it is found, on the examination of ſuckers of this deſcription, planted in a nurſery, that they bid fair to make ſound trees. The butt of a planted elm has never been ſeen to be unſound, unleſs from great age, or external injuries: it is conſequently adviſed to plant, in the firſt place, trees of this ſort from the nurſery, when of proper ſize, and to conſtantly ſupply the nurſery with ſuckers from the hedge-rows, as it may be done with little trouble and expenſe; and in the ſecond place, to cut off the connection and communication of young promiſing trees with their parent roots or ſtools early, opening the hedge-rows at three or four feet diſtant from the ſtems or ſtumps; as by theſe means ſound trees of this ſort may be eaſily raiſed and provided for different purpoſes.

Theſe trees are highly uſeful, both for timber and in the way of ornament, when planted out on large open ſpaces, or otherways; likewiſe for being clipped, or cut into particular forms, and as forming hedges in various ſituations. Theſe ſorts of trees, in their larger or ſmaller growths, are uſed for ſupplying thoſe and other intentions and purpoſes in many different methods. All the ſorts and varieties of the elm are of hardy growth, and will ſucceed perfectly well in any common ſoil and expoſure, but delight moſt in a rich deep earth of a ſtiffiſh loamy nature, which is rather inclined to moiſture, the Engliſh ſorts having the beſt ſituations and ſoil, and the Wych and Dutch kinds thoſe which are inferior in theſe reſpects.

For moſt purpoſes, the plants of theſe ſorts of trees ſhould be planted out finally while they are in their young ſtates of growth, as from four or five, to ſix, eight, or ten feet in height, in which they commonly take root, grow, and eſtabliſh themſelves the moſt freely, expeditiouſly, and in the fulleſt manner.

It may however be particularly noticed, that elms will bear removing when large, better than moſt other ſorts of trees, as they are more furniſhed with ſuperficial horizontal root-fibres. Thus, trees of fifteen or twenty feet in height may often be taken up with a large ſpread of roots and balls of earth about them, and be ſafely removed by being replanted in ſpacious pits or holes dug for them, where they readily ſtrike new root, and grow ſtrongly. But the removing and tranſplanting of theſe large trees is not by any means a proper or deſirable practice for making plantations, or other ſorts of field planting, but merely occaſionally for particular uſes and purpoſes, where ſhade, ſhelter, or a blind to ſome part is wanted.

The moſt proper and ſuitable time for planting out and removing all ſuch plants and trees, is from the beginning of autumn

autumn until the early part of the following ſpring. See PLANTATION and PLANTING.

All theſe ſorts of trees, but eſpecially the common Engliſh, Corniſh and Wych kinds and varieties, are highly proper for different denominations of foreſt and timber plantations in mixture with other ſorts of trees, or as an ulmarium, and in groups, ranges, hedge-rows, or clumps, on the borders, ſides, boundaries and corners of fields, large parks, avenues, pleaſure-grounds, or other out-grounds, as growing freely, and forming large-ſized valuable timber for a number of ſtrong uſes, ſuch as moſt kinds of wheel-wright work, pipes for conducting water under the ground, water-pumps, and various other under-water and durable purpoſes. Alſo in garden plantations, thickets, and other ways, for variety, diverſity, ornament, ſhade and ſhelter, near walks and other places, to break and keep off the violence of ſtorms and tempeſtuous blaſts, letting them in all ſuch caſes aſſume their own natural growth, only trimming away the ſtrong irregular lateral ſhoots and low ſtraggling branches on the ſtems and in the heads. They are likewiſe admirable for training, by means of which beautiful lofty hedges, quite cloſe from the top to the bottom, from the height of ten to more than forty feet, were formerly made and much valued on the confines of gardens and in other places, for ſcreens and in other deſigns. They were frequently too trained as arches, porticoes, pilaſters, galleries, and other forms, producing much effect in the ancient mode and ſtyle of ornamental gardening, but which at preſent is almoſt wholly exploded. The Engliſh and Corniſh ſorts are here by far the beſt, in conſequence of their more thick and regularly branching growth, as well as their more cloſe foliage.

ULNA, in *Anatomy*, one of the bones of the fore-arm. See EXTREMITIES.

ULNA, *Fracture and Luxation of the*, in *Surgery*. See FRACTURE and LUXATION.

ULNA, an ell in meaſure. See ELL and MEASURE.

ULNA *Ferrea*, denotes the ſtandard iron ell, kept in the Exchequer.

ULNAGE. See ALNAGE.

ULNAR *Artery* and *Nerve*, in *Anatomy*. See ARTERY and NERVE.

ULNARIS, a name given to ſome muſcles of the fore-arm.

ULNARIS *Gracilis*, the palmaris longus. See PALMARIS and FASCIA.

ULNARIS *Externus*,
ULNARIS *Internus*
ULNARIS, *Extenſor Carpi*,
ULNARIS *Flexor Carpi*, } Names given to certain muſcles of the fore-arm. See CARPI.

ULOPHONUS, in *Botany*, is a name given by the ancients to a poiſonous plant, ſince called the *chamæleon thiſtle*, and even at that time known to Dioſcorides, Galen, and others, under the name of the *black chamæleon thiſtle*. See IXIAS.

ULOTA, a new genus of Moſſes, eſtabliſhed by the late Dr. Mohr, of Kiel, in Sims and Konig's Annals of Botany, v. 2. 540. t. 14. f. 3, 4 and 6, and named from ουλος, *curled*, in alluſion to the curling of the leaves by drying. This character diſtinguiſhes the genus in queſtion, as to habit, from ORTHOTRICHUM; ſee that article. The eſſential generic difference between theſe two genera conſiſts in the ſtructure of the *Calyptra*, or Veil. In *Orthotrichum*, that part is marked with broad furrows, ſeparated by narrow ridges, which are cloven at the bottom: in *Ulota*, the veil is furniſhed with broad convex ridges, ſeparated by narrow furrows, which furrows are cloven, very deeply, at the bottom.

The author of this genus has wiſely kept in view the Linnæan maxim, *genus dabit characterem, non character genus*; but the meaning of this maxim he has totally miſrepreſented in a note, Ann. of Bot. v. 2. 535, as follows. "In the ſeries of natural beings the genera are altogether natural, being as given by nature herſelf; in the ſyſtem they muſt be artificially determined, but when we ſhall become true obſervers, we ſhall find means to make our genera natural alſo." We preſume this note was written by Dr. Mohr, and not by his editor. If it be correctly tranſlated, we are obliged to obſerve that the author has explained away the meaning of this great principle, on which the ſcience of generic diſtinction abſolutely depends. Linnæus meant that an idea of each genus is to be conceived in the mind, from an enlarged contemplation of the natural habit, and predominant technical characters of the fructification, all conſidered together, in a number of plants nearly related to each other. As the natural genera thus preſent themſelves to the mind of a learned obſerver, he will then be able to ſeize one or more eſſential characters of each, to diſcriminate them from each other. Genera thus eſtabliſhed are independent of all ſyſtem, whether natural or artificial. This is making the *genus give the character*. If we make the *character give the genus*, we might in many inſtances found as many genera as there are ſpecies. Dr. Mohr has followed the firſt rule in the formation of his genus *Ulota*, of which he ſays he has, beſides ſpecies already known, about a dozen exotic ones, moſtly nondeſcript; all are characterized at firſt ſight by their criſped foliage, and marked by the above character in the *calyptra*. But when Dr. Mohr, in p. 541, 542, of the ſame volume, expreſſes doubts of the propriety of having recourſe to the form and ſtructure of the capſules of moſſes, in forming their generic characters, "becauſe it will oblige us to divide *Polytrichum* and other genera into ſeveral new ones, and to make more ſuch unnatural alterations," he forgets that this would be to *make the character give the genus*, the very principle which is prohibited by the Linnæan rule. It is on this rule that we find ourſelves perpetually obliged to inſiſt. Botaniſts of the French ſchool ſeem, by a ſort of fatality, unable to comprehend it, or at leaſt incompetent to follow it. Some have occaſionally undertaken to demonſtrate its "abſolute falſehood;" but they were not ſuch as could handle mathematical tools. No botaniſt can eſtabliſh permanent genera, but by chance, without making this rule his only guide.

Dr. Mohr has not defined the ſpecies of his *Ulota*, which he ſays are chiefly nondeſcript. We are therefore unable to give more than two or three examples of the genus. Its claſs and order are *Cryptogamia Muſci*. Nat. Ord. *Muſci*.

Eſſ. Ch. Capſule oblong. Outer fringe of ſixteen teeth; inner variable, or wanting. Veil with convex ribs; the intermediate furrows cloven at the baſe.

U. *criſpa*. Common Curling-moſs. (Orthotrichum criſpum; Hedw. Crypt. v. 2. 96. t. 35. Sm. Fl. Brit. 1266. Engl. Bot. t. 996. Turn. Muſc. Hib. 93. Bryum ſtriatum δ; Linn. Sp. Pl. 1580. Polytrichum capillaceum criſpum, calyptris acutis piloſiſſimis; Dill. Muſc. 433. t. 55. f. 11.)—Leaves linear; revolute when dry. Capſule cylindrical, furrowed. Veil hairy.—Native of various parts of Europe, growing on the trunks of trees. Not unfrequent in Britain, flowering very early in the ſpring, ripening fruit in April. The *ſtems* are branched from the bottom, forming denſe leafy tufts. *Leaves* crowded, linear, acute, entire, ſingle-ribbed; when dry rolled back in their whole length, and curled at the edges. *Fruit-ſtalk* riſing about half its length above the leaves, twiſted when dry, as is alſo the baſe of the *capſule*, whoſe whole length is marked with eight

eight strong furrows. *Fringe* of eight pairs of spreading combined teeth; inner one of eight simple capillary teeth. Hairs of the *veil* erect, finely jointed.

U. *torquata*. Spiral Curling-moss. (Hypnum torquatum; Swartz Prodr. 142. Hedw. Sp. Musc. 246. t. 63. f. 4—7. Neckera torta; Swartz Ind. Occ. 1800.)—Leaves lanceolate: spiral and close-pressed when dry. Capsule ovate, even. Veil naked.—Found on the mossy trunks of old trees in Jamaica, by Dr. Swartz; in New Zeeland by Mr. Menzies. The trailing shoots throw up many erect, thick, subdivided *branches*, an inch high, densely clothed with *leaves* of a shining golden hue, turning brown with age; all spirally twisted, and somewhat undulated, pointed, entire, with a strong mid-rib. *Fruit-stalks* above an inch long, angular, red, shining, rising high above the branches, and at length spiral. *Capsule* erect, ovate rather than cylindrical, brown, turgid, quite smooth and even. *Veil* of a brilliant golden colour; brown at the tip; split at the base into many narrow convex segments; its surface quite naked.—Such are our specimens from Mr. Menzies, on whose authority we depend for the synonym of Swartz. Indeed Hedwig's figure, though rude, is expressive of our plant. Dr. Mohr's fig. 3. exactly represents its *calyptra*. This is said to belong to a moss nearly related to *Anictangium cirrhosum*, Hedw. Sp. Musc. 42. t. 5. f. 1—3. (Neckera cirrosa; Sw. Ind. Occ. 1802.) which may be what we have here described.

U. *polytrichoides*. Slender Curling-moss. (Neckera polytrichoides; Swartz Ind. Occ. 1796. Hypnum polytrichoides; Sw. Prodr. 141. Hedw. Sp. Musc. 244. t. 61. f. 7, 8.)—Leaves ovate, pointed, concave, twisted; two-ribbed at the base. Capsule oblong. Veil hairy.—Gathered by Dr. Swartz, on the branches of trees and shrubs, as well as on stones, in the mountainous parts of Jamaica. The *shoots* are three or four inches long, ascending, more or less crowded, somewhat branched. *Leaves* scattered, not imbricated, spreading, wavy, entire, except some fine serratures near the point; under a magnifier they prove finely reticulated. *Fruit-stalks* rather shorter than the leaves, three lines only in length, lateral, red. *Capsule* oblong, erect. *Veil* clothed with erect hairs.

ULOTHO, or Ulothow, in *Geography*, a town of Westphalia, in the county of Ravensberg, with a Lutheran and a Roman Catholic church; near it is a medicinal spring; 6 miles S. of Minden. N. lat. 52° 5′. E. long. 8° 45′.

ULPHA, a term used by some authors to express the muddy substance which falls off from whet-stones, grind-stones, and the like, which is sometimes ordered in medicines among the chemical writers, and is only the comminuted particles of the stone, with a very small portion of iron abraded from the things ground on them.

ULPHILAS, in *Biography*, a Gothic bishop, was a native of Cappadocia, referred by Philostorgius to the year 326, and highly honoured by Constantine the Great, who called him the Moses of his time. At this period he must, therefore, have arrived at maturity of age; and as he was employed in the year 375 by the emperor Valens to solicit a settlement for the Goths in Thrace, after they had been expelled by the Huns, and embraced Arianism in order to accomplish his object, he must have lived to a very advanced age. To him historians ascribe the invention of the Gothic characters and the translation of the Bible into that language. See Argenteus *Codex*.

ULPIA CASTRA LEG. 30, in *Ancient Geography*, a town of Gallia Belgica, upon the banks of the Rhine, between Burginatium and Vetera. Anton. Itin.

ULPIANUM, a town of Upper Mœsia, in Dardania (Ptol.), said by Procopius to have been repaired and embellished by Justinian, and called "Justiniana secunda."—Also, one of the principal towns of Dacia. Ptol.

ULPIANUS, Domitius, in *Biography*, an eminent lawyer, was a native of Tyre, a disciple of Papinian, and tutor, as well as friend and minister, of the Roman emperor Alexander. Heliogabalus exiled him from the court on account of his virtues, but when his pupil became emperor he was recalled, and placed at the head of sixteen senators, who formed a council of state. He was also secretary of state and inspector over the two pretorian prefects, whose jealousy of his authority produced a mutiny among the soldiery, that proved fatal to themselves; and occasioned his advancement to the dignity of sole prefect. His wise and virtuous administration engaged universal esteem, until the emperor, probably at his suggestion, undertook to reform the army. The soldiers mutinied, and occasioned, for three days, a kind of civil war at Rome, which terminated in the massacre of Ulpian, A.D. 228, notwithstanding all the attempts of the emperor and his mother Mammæa to save him. The Heathen writers have concurred in their eulogies of Ulpian, but the Christians have reproached him, not unjustly, as their enemy; for, observing the emperor's favourable inclination to them, he collected all the decrees and edicts of the preceding sovereigns against them. This hostility is ascribed to his professional attachment to the laws. Of Ulpian's writings there are extant twenty-nine titles of fragments, which are annexed to some editions of the civil law. Crevier. Gibbon's Hist.

ULPICUM, in *Botany*, a name by which Columella, and some other authors, have called the *allium*, or garlic.

ULRACH, a name given by some writers to the *sanguis draconis*, or dragon's blood.

ULRICHEN, in *Geography*, a village of the Valais, in the dixain of Goms; famous in the history of the country for two battles fought here in 1211 and 1219, for the establishment of their freedom and independence; 8 miles N.E. of Munster.

ULRICHSKIRCHEN, a town of Austria; 7 miles N.E. of Korn Neuburg.

ULRICHSTEIN, a town of Upper Hesse; 18 miles W. of Fulda.

ULRICSHAMN, or Ulricahamn, a town of Sweden, in West Gothland. This town was anciently called Bogesund; the present name was given it in compliment to queen Ulrica Eleonora in the year 1741. The inhabitants carry on a considerable trade in cattle, provisions, tobacco, &c.; 47 miles E. of Gothenburg. N. lat. 57° 48′. E. long. 13° 19′.

ULSE, a river of France, which runs into the Moselle, 6 miles N. of Traarbach.

ULSEN, a town of Germany, in the county of Bentheim; 5 miles W. of Nienhuus.

ULSTADT, a town of the duchy of Baden, with a salt-spring; 9 miles E.S.E. of Spire.

ULSTER, a river of Hesse, which runs into the Werra, near Vacha.

Ulster, one of the provinces of Ireland, forming the northern part of the kingdom; it contains nine counties, and is in general the most improved part of Ireland. It was mostly forfeited in the reign of James I. and divided amongst settlers from England and Scotland, which is called the plantation of Ulster.

Ulster, a county of New York, in the United States, which, with Dutchess, had two delegates in the first legislative assembly of the colony, which met at New York in 1691.

1691. It was one of those formed by the general organization acts of 1788 and 1801, and has constituted one of the colony and state of New York ever since 1691, though the boundaries have been altered. Several towns have been annexed to Orange county, and Sullivan county has been erected from the northern part. It is bounded northerly by Delaware and Greene counties, E. by the Hudson, or by Columbia and Dutchess counties, S. by Orange, and W. by Sullivan county. The area is estimated at 966 square miles, or 617,440 acres. It is situated between 41° 33′ and 42° 19′ N. lat., and 66′ E. and 47′ W. long. from New York. Its towns are Esopus, Hurley, Kingston the capital, Marbletown, Marlborough, New-Paltz, Plattekill, Rochester, Saugerties, Shandakan, Shawangunk, Wawarsing and Woodstock. Its population consists of 26,576 persons. This county is considerably broken by the Catsbergs, or Catskill mountains. The soil is of various qualities. The channel of the Hudson forms the eastern boundary of Ulster, and the small streams are very numerous. The uplands are, in general, rich and productive; and the flats along its streams are very extensive, with considerable tracts of recent and rich alluvion, though interspersed with clay and argillaceous mould. The agriculture of this county is inferior to that of Dutchess. Its marble is very fine; the mill-stones of Esopus are in high estimation: lime-stone, slate, marle, and iron-ore are found in great abundance; and lead, native alum, plumbago, coal, peat, and a variety of pigments, have been found in this county. It has thirteen congregations and houses of worship belonging to the Dutch reformed, and several Quaker and Methodist meeting-houses; and at Kingston there is a flourishing academy. The early inhabitants of this county were Germans and Dutch, and it was settled at a very early period of American history. Kingston, the capital, is delightfully situated between Esopus and Wall creeks, and contains about 150 houses and stores. Many of the houses are of stone. Ulster, with Sullivan county, sends four members to the house of assembly.

Ulster, a township of America, in the state of Pennsylvania, and county of Lycoming, containing 627 inhabitants.

ULTERIOR, in *Geography*, is applied to some part of a country or province, which, with regard to the rest of that country, is situate on the farther side of a river, mountain, or other boundary, which divides the country into two parts.

Thus Africa, with regard to Europe, is divided by Mount Atlas into citerior and ulterior, *i. e.* into two portions, the one on this side Mount Atlas, and the other on that.

ULTIMA BASIA, *Last Kisses*, is a phrase used among some painters, for last finishing touches with the pencil.

ULTIZURI, in *Ancient Geography*, a barbarous people, comprehended under the general name of Huns, who made themselves famous until the reign of the emperor Leon.

ULTRAMARINE, is a beautiful and durable sky-blue, formed of the mineral called lapis lazuli, and consisting, according to the analysis of Klaproth, of little else than oxyd of iron. It is separated from the earthy parts of the above-mentioned mineral in the following manner. Let the lapis lazuli be heated just to redness, and then suddenly quenched in cold water, and let this be repeated two or three times, till the stone becomes almost friable; then let it be ground down with a few drops of water in a clean iron mortar, or, still better, in an agate one, till it is reduced to a perfectly impalpable powder. Then take one pint of linseed oil, warm it over the fire in a clean vessel, and add one pound of bees-wax, one pound of turpentine, half a pound of rosin, and half a pound of gum mastich: keep the ingredients over the fire, with constant stirring, till they are melted and thoroughly incorporated together; the result will be a tenacious adhesive mass. Of this take any quantity, six ounces for example, melt it and pour it into a warm clean mortar; then sprinkle upon it three ounces of pulverized lapis lazuli, and incorporate it thoroughly by long beating with the pestle; this being done, pour in some warm water, and again work it about in the same manner as before: in a short time the water will become charged with the blue colouring matter; it must then be poured into a clean tall glass, and replaced by fresh, proceeding in this manner till the paste will give out no more colour on the addition of fresh water. By standing a few days the colour will subside from the water in which it was suspended; the clear fluid being then decanted off, and the rest got rid of by evaporation, there will remain a deep-blue powder, which is ultramarine. See Lazuli *Lapis*.

Ultramarine *Ashes*, is the name of a pigment which is the residuum of the lapis lazuli, after the ultramarine has been extracted from it. But as the coloured particles which remain are mixed with those of another kind contained in the lapis lazuli, these ashes must of course be much less valuable than even the worst ultramarine.

Their appearance is that of the ultramarine, a little tinged with red, and diluted with white. The adulteration to which they are subject, and gives them a better appearance than that of their genuine state, may be detected by the methods proposed for discovering the sophistication of the ultramarine. See Lazuli *Lapis* and Blue.

ULTRAMONTANE, something beyond the mountains. The term is principally used in relation to Italy and France, which are separated by the mountains of the Alps.

In France, the opinions of the ultramontane canonists, *i. e.* of those of Italy, are not received.

The painters, particularly those of Italy, call all those that are not of that country ultramontanes, or simply, tramontanes. Poussin is the only tramontane painter that the Italians seem to envy.

ULTRAMUNDANE, Ultramundanus, *Beyond the World*, is that part of the universe supposed to be without or beyond the limits of our world, or system.

ULTZEN, or Veltzen, in *Geography*, a town of Westphalia, in the principality of Luneburg, on the Ilmenau. It contains three churches, three hospitals, and about 330 houses; the principal articles of trade are wool, brandy, and meal. It was at one time Hanseatic; 20 miles S.S.E. of Luneburg. N. lat. 52° 58′. E. long. 8° 22′.

ULVA, in *Botany*, a Latin word, occurring more frequently in the poets than any where else, and possessing a general, rather than a very precise or appropriate, meaning. Pliny has it not. Virgil and Ovid often mention it, with the epithets of *viridis, levis, mollis, palustris, glauca, fluminea;* and Vitruvius speaks of roofs made of "the marsh *Ulva*." Hence Cæsalpinus and others have been led to believe the *Typha*, or perhaps the whole tribe of Bulrushes, Sedges, &c. were understood by this appellation. Perhaps *Ulva* is simply synonimous with *aquatic plants* in general; which opinion is confirmed by the etymology pointed out by De Theis. He refers this word to the Celtic *ul*, water, the origin of *uligo*, ooze, and synonimous with *lu*, from whence comes *lutum*, mud, &c. Dillenius latterly rejected *Ulva* entirely, because of its uncertain meaning; adopting *Tremella*, which he considered as more expressive. Linnæus, distinguishing Tremella (see that article) as a freshwater genus, with less decided characters, retains *Ulva* for one chiefly of marine origin, more membranous in habit, and

and sufficiently well marked by the arrangement of its seeds, by which it differs from *Fucus*. The English name Laver is well applied to the genus before us.—Linn. Gen. 567. Schreb. 768. Mart. Mill. Dict. v. 4. Dill. in Raii Syn. 62. Sm. Prodr. Fl. Græc. Sibth. v. 2. 331. Hudf. 566. Roth Catal. v. 1. 204. Juss. 6. Lamarck Illustr. t. 880.—Class and order, *Cryptogamia Algæ*, Linn. Nat. Ord. *Algæ submersæ*.

Eff. Ch. Frond membranous or gelatinous. Seeds solitary, scattered throughout its substance, under the cuticle.

Fewer difficulties attend the generic character of *Ulva* than that of several other marine *Algæ*, yet various things have been improperly referred to this genus. (See RIVULARIA.) Some excellent remarks on this subject are given by Mr. Woodward, in Tr. of Linn. Soc. v. 3. 46; and the same is ably treated by Dr. Roth, in the first volume of his learned *Catalecta*, above cited. We shall follow the last-mentioned author in his leading principles; regretting that we are still deprived of a more complete view of the whole genus, long promised by Mr. Dawson Turner; who in his peculiar attention to this natural order of plants, has enjoyed more opportunities than any other botanist, for their complete elucidation. These opportunities however may perhaps have served to make him the more fully aware of the difficulties of the undertaking. With respect to the existence of species, in which, as Mr. Woodward observes, "no actual fructification has been hitherto discovered," we can only say that these are referred by analogy of habit to *Ulva*, with which they accord at least as well as with any thing else, the same defect which renders their place here doubtful, disabling us from removing them elsewhere. We shall enumerate all the known British *Ulvæ*, with such exotic ones as appear to be well determined, aiming rather at giving a general idea, than a complete view of the genus.

Sect. 1. *Frond expanded, leafy.*

1. U. *pavonia*. Turkey-feather Laver. Linn. Syst. Nat. ed. 12. v. 2. 719. Sm. Prodr. Fl. Græc. Sibth. n. 2515. Engl. Bot. t. 1276. (Fucus maritimus, gallo pavonis pennas referens; Raii Syn. 43. Tourn. Inst. 568. Ellis's Corallines, 88. t. 33. f. *c. D, E.* Moris. sect. 15. t. 8. f. 7.)—Frond membranous, flat, kidney-shaped, with a taper base. Seeds in transverse arched lines.—Found attached to submarine rocks and stones, on the southern coast of England, as well as throughout the Adriatic and Mediterranean seas, and on the shores of France, Spain, and Portugal. Several *fronds*, from one to three inches high, grow from one central *root*, spreading circularly and horizontally, each of them rounded at the extremity, either undivided or lobed, entire at the edges, of a light greenish-brown. The *seeds* are thickly lodged, in many brown, arched, transverse, continued lines, making an elegantly striped appearance, and resembling the feathers of a turkey-cock. This arrangement of the *seeds* can scarcely be thought to contradict the generic character; for it appears, in other species, that the expansion of the frond, after the first formation, and *fixation*, if we may so express it, of the *seeds*, cannot but separate them, more or less accurately, into patches or stripes. These stripes are nevertheless, as we must allow, more determinate, from the very first, than in any other known species. The *seeds* are oval, about two rows in each stripe.

2. U. *flabelliformis*. Green Fan Laver. Wulfen Crypt. Aquat. n. 11. Decand. Fr. suppl. 4. Prodr. Fl. Græc. n. 2516. (Conferva flabelliformis; Desfont. Atlant. v. 2. 430. Flabellaria Desfontainesii; Lamouroux Ann. du Mus. v. 20. 274. t. 12. f. 4. Tussillagine dell' Adriatico; Ginann. Adriat. v. 1. 25. t. 25. f. 56.) — Frond spongy, filamentous, flat, fan-shaped, laciniated and jagged, with a taper base.—Native of the Adriatic and Ionian seas. Rather taller than the foregoing, of a light spongy texture, and uniform green colour, without any visible *seeds*. The genus of this plant is unquestionably very doubtful, yet a vague resemblance to *U. pavonia*, makes us more willing to place it here than any where else. With *Conferva* it ill accords, and few botanists will follow Ginanni in making it a *Tussilago!*

3. U. *atomaria*. Concentric-dotted Laver. Woodw. Tr. of Linn. Soc. v. 3. 53. Engl. Bot. t. 419.—Frond membranous, flat, dilated, palmate; segments linear, slightly branched; sometimes fringed.—Found washed up on the Yarmouth coast, by Mr. Lily Wigg. The *root* is a small, dilated, downy disk, bearing a pale olive-brown, thin, wedge-shaped, spreading *frond*, four or five inches high, deeply cut into numerous, unequal, irregularly jagged and perforated, oblong or linear, occasionally fringed, segments; the whole marked with many transverse concentric stripes, of a darker hue, full of minute brown *seeds*.

4. U. *ligulata*. Laciniated Red Laver. Woodw. Tr. of Linn. Soc. v. 3. 54. Engl. Bot. t. 420.—Frond membranous, flat, branched; branches dilated, somewhat forked, with obtuse sinuses; terminated and fringed with strap-shaped segments.—Found by Mr. Wigg, on the Yarmouth beach, along with the last; but Mr. Woodward met with it, in a growing state, on the rocks at Cromer, Norfolk. The *root* is a small callous disk. *Fronds* clustered, from three to six inches high, of a light rather bright red, membranous, but varying in density; their general outline wedge-shaped, deeply cut into a few principal branches, which subdivide into others, and are fringed about the bottom with many very narrow segments, rather blunt at their ends. *Seeds* extremely minute and abundant, scattered throughout the whole substance, in cloud-like spots or patches.

5. U. *Lactuca*. Green Laver, or Oyster-green. Linn. Sp. Pl. 1632. Hudf. 566. Engl. Bot. t. 1551. Prodr. Fl. Græc. n. 2520. Roth. Catal. v. 1. 206. (U. marina, lactucæ similis; Dill. in Raii Syn. 62. Tremella marina vulgaris, lactucæ similis; Dill. Musc. 42. t. 8. f. 1.)—Frond membranous, pellucid, palmate, bright green; segments contracted below; dilated upwards, obtuse, plaited.—Native of most of the shores of Europe, and perhaps other parts of the world, growing on stones, pebbles, shells, and the larger sea-weeds, forming annual tufts of thin green *leaves*, uniform in colour and texture, but very various in figure and dimensions; being sometimes simple and undivided, but more frequently palmate, lobed, or proliferous. They always taper downward, and have no ribs nor veins. The very minute *seeds* are equally dispersed.—This is the Laver, so often introduced at fashionable tables, within a few years past, being stewed and seasoned with lemon juice, which moderates its salt bitterish flavour and "sea-weed scent;" nor is this dish unpleasant, after a short trial, to most palates. We suspect it to have been originally contrived with a medical intention, for the benefit of scrophulous patients, so numerous, alas! in the gay circles of the opulent and great. Where laxatives are useful or admissible, nothing can be better applied.

6. U. *lubrica*. Slippery Laver. Roth. Catal. v. 1. 204. t. 5. f. 7, excluding the synonyms.—Fronds tufted, oblong, convoluted, inflexed, undulated, rugose, interbranching, very thin and slippery.—Found in stagnant ditches of fresh water, in marshy parts of Germany. In the spring and beginning of summer, the plant is fixed to the bottom of the pool or ditch, in dense, roundish, deep-green patches, and is so ex-

cessively

ceſſively tender, gelatinous, and ſlippery, as ſcarcely to be gathered entire. The length of each *frond* is from two to five inches; the breadth, as far as the convoluted and entangled habit of the plant will allow that matter to be aſcertained, is from one to three lines at moſt. *Roth.*

7. U. *terreſtris.* Thin Ground Laver. Roth Catal. v. 1. 211. (U. criſpa; Lightf. 972. Hudſ. 661. U. Lactuca γ; Hudſ. 567. Tremella terreſtris tenera criſpa; Dill. Muſc. 52. t. 10. f. 12.)—Fronds membranous, very thin, decumbent, cluſtered, curled and plaited.—Found on the ground, in ſhady places, on gravel walks, and ſometimes on old thatched roofs, ſcarcely attached by any viſible roots. It does not ſhrink up to nothing, in dry weather, like a *Tremella*, though moſt vigorous in wet. The *fronds* lie over each other, and are of a deep, though ſhining, green. No *ſeeds* are diſcernible.

8. U. *bulloſa.* Cellular Green Laver. Roth Catal. v. 3. 329. Engl. Bot. t. 2320. (U. Lactuca β; Hudſ. 567. Tremella paluſtris, vulgari marinæ ſimilis, ſed minor et tenerior; Dill. Muſc. 44. t. 8. f. 2.)—Frond membranous, very tender, dilated upwards, variouſly ſinuated, cellular, bright green.—Found in ſhallow ſtagnant ditches of freſh water, in Germany and England. Dillenius obſerved it in meadows behind Newington; Mr. W. Borrer at Henfield, Suſſex, in July. The former remarked that as warm weather came on, the plants floated on the top, turned yellowiſh, and became full of air-bubbles, as if in fermentation. In this ſtate perhaps the ſeeds are ſcattered. The whole plant is ſmaller than *U. Lactuca;* of which it has been thought a variety; much more ſlippery and ſlimy, ſo tender as ſcarcely to be gathered without breaking. The *frond* is variable in ſhape; cellular like a cabbage-leaf when full-grown; appearing beautifully dotted when examined with a microſcope.

9. U. *plicata.* Plaited Firm Laver. Fl. Dan. t. 829. Roth Catal. v. 1. 208. Uſt. Annal. v. 1. 5. (Muſcus marinus alter Plinii; Camer. Epit. 872. Lichen marinus; Ger. Em. 1566.)—Fronds green, plaited, laciniated, elongated; combined and imbricated at the baſe.—Found attached to ſubmarine rocks, ſtones, and large ſhells. This varies in length from one to twelve inches. Dr. Roth diſtinguiſhes it from *U. Lactuca* by its more opaque green colour, and firmer more rigid ſubſtance. It is alſo more complicated in form, as well as more plaited longitudinally, and jagged at the edges. We have not been able to compare theſe two plants, but from the analogy of ſome others, ſhould ſuſpect them to be merely varieties.

10. U. *plantaginea.* Plantain-leaved Laver. Roth Catal. v. 2. 243. Engl. Bot. t. 2136. (Tremella marina, calendulæ folio atro-virente et verrucoſo; Dill. Muſc. 46. t. 9. f. 4.)—Fronds aggregate, membranous, ſimple, oblong, obtuſe, flat, entire, minutely warty, brown; tapering at the baſe.—Native of the coaſts of Italy and England. The *fronds* ſpring from a cartilaginous diſk, and are from three to ſix or eight inches high, an inch broad, of a very dull olive-brown, firm, not adhering to paper in drying; the ſurface beſprinkled with ſlightly prominent warts; the baſe of each tapering into a ſhort ſtalk. This ſpecies is very generally found eroded by marine animals.

11. U. *umbilicalis.* Peltate Laver. Linn. Sp. Pl. 1633. Hudſ. 567. Engl. Bot. t. 2286. (Tremella marina umbilicata; Dill. Muſc. 45. t. 8. f. 3.)—Frond rather coriaceous, purpliſh-olive, orbicular, ſeſſile, peltate, ſpreading nearly flat, variouſly lobed.—Frequent on the ſea-coaſt, growing ſolitary or diſperſed, attached to rocks or ſtones by its central root, and often waſhed up on the ſandy beach. Its more coriaceous ſubſtance, and browner, ſomewhat purpliſh, colour, diſtinguiſh this *Ulva* from the *Lactuca* and *plicata*. The ſurface is very ſmooth, and ſhining. Each plant is a ſpan or more in diameter, orbicular, variouſly cut or lobed, even to the very centre; the edges and lobes criſped, wavy and jagged, not imbricated; the internal ſubſtance finely cellular, appearing dotted. *Seeds* diſperſed in ſmall maſſes, darker than the frond. Mr. Borrer conceives Roth's *U. purpurea*, Catal. v. 1. 209. t. 6. f. 1, which, according to ſir Thomas Frankland's ſpecimen, is Hudſon's *fuſca*, to be an oblong variety of *umbilicalis*. *U. laciniata*, Lightf. 974. t. 33, may be, as Hudſon ſuſpects, another variety.

12. U. *meſenteriformis.* Meſenteric Laver. Roth Catal. v. 1. 210.—Frond ſolitary, oblong, broad, plaited, wavy, cellular and rugoſe, dark green.—Native of the northern ſeas of Europe, or of muddy ſalt-water ditches on the coaſts of Oldenburgh and Bremen. Various in ſize and ſhape, ovate, roundiſh or oblong, eighteen inches or more in length, and ſometimes a foot broad, ſo much plaited and corrugated that it cannot be laid flat, nor does it adhere to paper. Roth compares this to *U. latiſſima* of Linnæus, which we find by the original ſpecimen to be only *Fucus ſaccharinus*, more cellular than ordinary; and we are much inclined to believe Roth's *meſenteriformis* to be no other, the varieties of that *Fucus*, in ſize and configuration, according to its age, being almoſt endleſs.

13. U. *coccinea.* Scarlet Laver. Hudſ. 567.—"Flat, roundiſh, membranous, ſinuated, ſcarlet."—On ſubmarine rocks and ſtones, near Plymouth and Falmouth. *Frond* from ſix inches to a foot in diameter, wavy, pellucid and ſhining. *Seeds* numerous, ſmall, roundiſh, dark purple. *Hudſon.* This may probably be *Fucus punctatus*, Engl. Bot. t. 1573.

14. U. *furcellata.* Reddiſh Forked Laver. Turner in Schrad. Journ. v. 3. 301. Engl. Bot. t. 1881.—Frond nearly cylindrical, gelatinous, repeatedly forked, reddiſh; ultimate ſegments flattened, lanceolate, cloven.—Gathered by Mr. Turner, at Sheringham, Norfolk, and by Miſs Biddulph, at Southampton. *Fronds* ſeveral, from three to ſix inches high, tender, gelatinous, nearly of equal thickneſs throughout, except the flattened ends. *Seeds* large, ſparingly ſcattered juſt under the cuticle. The colour of the whole is a pale browniſh-red, ſometimes greeniſh.

15. U.? *multifida.* Laciniated Brown Laver. Engl. Bot. t. 1913.—Frond rather cartilaginous, brown, compreſſed, repeatedly branched, ſomewhat palmate. Seeds irregularly ſcattered. Root ſmooth.—Found by Mr. Turner, in Auguſt 1804, on the beach at Yarmouth, where it is of very rare occurrence. This has much of the hue and general aſpect of *U. atomaria*, n. 3, but the *root* is ſmooth; ſubſtance of the *frond* very much firmer and thicker; *ſeeds* not diſpoſed in concentric lines, but thickly ſcattered over the frond in ſmall round cluſters. By Mr. Sowerby's drawing, they ſeem, when highly magnified, to be congeries of oblong, ſtalked *ſeed-veſſels*, with three or four *ſeeds* in each, rendering the plant a *Fucus* rather than an *Ulva*. However ſmall, they give a palpable roughneſs to the frond.

16. U. *montana.* Red Mountain Laver. Lightf. 973. Hudſ. 652. Engl. Bot. t. 2193.—Frond leathery, dark red, of numerous, aſcending, rounded, flattiſh, finely granulated lobes.—This grows on the ground, amongſt graſs and moſs, on the ſides of mountains in Skye, Roſsſhire, Dumfriesſhire, &c. being called Mountain Dulſe by the highlanders, who make a thin pulpy mixture, by rubbing the plant between their hands, into ſome water, with which they purge their calves. It has the ſmell of Common Dulſe,

Dulfe, or *Fucus palmatus*, to which, though growing in fo different a ftation, the prefent *Ulva* has much natural affinity. The colour of both is a deep dull red, feldom greenifh, or brown, and their fubftance, when foaked, is alike pulpy and mucilaginous, with a fea-weed odour. Our prefent plant, however, is much the fmalleft, being rounded, not palmate, fcarcely notched, each *frond* or *lobe* from half an inch to two or three inches wide, generally convex. Innumerable internal granulations, the feat, as we prefume, of the *feeds*, raife the cuticle in fuch a manner as to give a roughnefs to the furface.

17. U. *rupeftris*. Broad Rock Laver. Engl. Bot. t. 2194. — Frond leathery, depreffed, very wide, indeterminate, fmooth and flippery, of a dull red.—The only fpecimen of this remarkable vegetable that ever occurred to our notice, grew on the wet fhady furface of a rock, above Tylogé bridge, by the river fide, at Hafod, Cardiganfhire; the fine feat of the celebrated Mr. Johnes, fo well known by his tranflations of the old French hiftorians, and now fo much lamented by all who truly knew him. We can compare this plant to nothing better than a well-foaked fkin of parchment, both in fize and texture, though more tender, and jagged at the edges, fo that it could not be ftripped entire from the rock, nor could the form of its outline be afcertained. It dried fpeedily, flightly adhering to paper, and fhrinking confiderably in width; but recovered its original appearance many years afterwards, on the application of water, when numerous, minute, granular, dotted bodies, prefumed to be *feeds*, were found imbedded in the fibrous fubftance under the cuticle, not projecting, fo as to produce a roughnefs, like the *montana*. We cannot doubt the ftrict affinity of this to the laft, though they muft be fpecifically diftinct.

18. U. *dichotoma*. Green Forked Laver. Hudf. 568. Lightf. 975. t. 34. Engl. Bot. t. 774. (Fucus membranaceus dichotomus gramineus; Raii Syn. 45, according to Hudfon.) — Frond membranous, quite flat, repeatedly forked, reticulated, pale-green, with linear, obtufe fegments. —Found on the coafts of Scotland and Cornwall, in fummer time. The whole plant, three or four inches high, and of a wedge-fhaped or fan-like figure, is thin and flat, curioufly reticulated internally like a *Fluftra*, or like our n. 2, *U. flabelliformis*. The fegments are alternate, from one line to three in breadth, generally notched at the end, but otherwife very entire. *Seeds* blackifh, difperfed, with a feries of imbedded bladders, between them and the margin of the leaf.

19. U. *Linza*. Ribband Laver. Linn. Sp. Pl. 1633. Hudf. 568. Fl. Dan. t. 889. (Tremella marina fafciata; Dill. Mufc. 46. t. 9. f. 6. Linza; Imperato Ift. Nat. 651.) —Frond oblong-lanceolate, folded, green, fomewhat undulated and cellular.—Native of falt-water ditches, and receffes of the fea among rocks, in various parts of Europe. Its form is oblong, ribband-like, acute, when full-grown folded and wavy, always membranous and pellucid; its length a foot or more. Mr. Turner in Tr. of Linn. Soc. v. 7. 108, records, that he found the original fpecimen of this in the Dillenian herbarium to confift of two long narrow pieces of different things, *U. Lactuca* and *umbilicalis*. The figure however reprefents what we underftand by *U. Linza*, and agrees with *Fl. Dan.* Mr. Turner affords us, in the place juft cited, a ftill more curious piece of information, that the *U. lanceolata* of Linnæus, taken up in his Syft. Nat. ed. 12. v. 2. 719, from Dillenius, is no other than *U. Linza*, the figure in Hift. Mufc. t. 9. f. 5. reprefenting feveral individuals of that fpecies, as pafted in the herbarium, with their tops downward, crowded together, and the roots upward! Thefe were communicated, it feems, by Mr. Brewer, from the Ifle of Man, and appear to be young plants, not yet become wavy or folded.

Sect. 2. *Frond concave, or tubular.*

20. U. *inteftinalis*. Gut Laver. Linn. Sp. Pl. 1632. Hudf. 568. (Tremella marina tubulofa, inteftinorum figurâ; Dill. Mufc. 47. t. 9. f. 7. Cava; Imperato Ift. Nat. 651.) —Frond tubular, membranous, green, irregularly cellular.— Common in falt-water ditches and pools, throughout Europe, attached to ftones and rocks. The *frond* is occafionally branched, according to Dillenius. Young plants hardly exceed a ftraw in thicknefs, and are even in furface, of a yellowifh or brownifh colour; but when full grown they become an inch or two in diameter, varioufly cellular, like a cabbage-leaf, and of a fine green; often floating to the furface, inflated with air, eighteen inches or two feet in length. In this ftate they refemble, except colour, the inteftines of fome animal. Nothing is known refpecting the *feeds*, which are probably perfected and diffeminated at the period juft defcribed.

21. U. *compreffa*. Compreffed Laver. Linn. Sp. Pl. 1632. Hudf. 569. Engl. Bot. t. 1739. (Tremella marina tenuiffima et compreffa; Dill. Mufc. 48. t. 9 and 10. f. 8. Conferva compreffa; Roth Catal. v. 1. 161.)—Frond tubular, more or lefs branched, compreffed, irregularly conftricted, green; the branches elongated.—Common on fubmarine rocks, ftones and pofts, as well as in falt ditches, throughout Europe. Dr. Sibthorp noticed this, along with the laft, in the fea near Conftantinople. The *fronds* grow in tufts, extremely variable in fize, and from two inches to a foot or more in height, each of them very flender at the bafe, where alfo they are moft branched; the *branches* are often greatly enlarged upwards, but frequently nearly cylindrical; they are interrupted here and there by ftrictures, at each of which the internal cavity feems divided by a tranfverfe membrane. Hence Necker and Roth made this plant a *Conferva*, but furely without fufficient reafon. The furface is even and fmooth; the colour fine green.

22. U. *ramulofa*. Green Sharp-branched Laver. Engl. Bot. t. 2137.—Frond tubular, very much branched, fomewhat compreffed, green; ultimate branches fcattered, extremely numerous, fharp-pointed.—Difcovered by Mifs Hutchins, in Bantry bay, Ireland. A very elegant fpecies, remarkable for the innumerable little branches, fcattered over each principal ramification, which give it the afpect of a *Conferva*. The height of the tufted *fronds* is three or four inches; their colour a beautiful green; and the furface, under a moderate magnifier, is found curioufly and uniformly dotted, perhaps with *feeds*. The fubftance of the plant is a little gelatinous, being far lefs membranous than *U. compreffa*.

23. U. *purpurafcens*. Purplifh Laver. Hudf. 569. Woodw. Tr. of Linn. Soc. v. 3. 52. Engl. Bot. t. 641. —Frond tubular, branched, nearly cylindrical, purplifh-brown; branches moftly oppofite, fimple or compound, acute.—This grows on fubmarine rocks and ftones, in various parts of the fouth coaft of England, being in perfection about the middle of fummer. Several *fronds*, about fix inches high, fpring from one fmall cartilaginous difk. Each, like its branches, tapers confiderably at the top and bottom, fwelling in the middle, to a line or two in diameter. The *branches* are two or three inches long, generally oppofite, and in fome degree two-ranked. Sir Thomas Frankland has favoured us with a repeatedly compound fpecimen, a foot long. The whole plant is juicy, of a light reddifh-brown, fmooth and even, with little black *feeds* fcattered copioufly and irregularly juft under the cuticle. Light-foot's

foot's *Fucus verticillatus*, Fl. Scot. t. 31, a plant we have never examined, is cited for this *Ulva* by Mr. Hudſon, p. 661; but the figure repreſents numerous ſtrictures in the main branches, with compound, whorled, capillary ſubdiviſions, nothing like which occurs in our ſpecimens.

24. U. *fiſtuloſa*. Pipe Laver. Hudſ. 569. Woodw. Tr. of Linn. Soc. v. 3. 52. Engl. Bot. t. 642.—Frond tubular, uniform, ſimple, bluntiſh, a little zigzag, gelatinous, yellowiſh-brown.—Found at Falmouth, and other parts of our ſouthern coaſt. Mr. Hudſon attributes to this ſpecies a creeping *root*. The *fronds* grow in cluſters, erect, three or four inches high, being ſtouter than the laſt, and conſtantly unbranched; their ſurface uneven or gibbous, with ſome appearance of ſtrictures; their baſe tapering; their termination abrupt and bluntiſh. *Seeds* very minute, ſcattered through the ſoft ſubſtance of the *frond*, viſible by their dark colour, contraſted with its very pale browniſh-yellow.

25. U. *Turneri*. Reticulated Laver. Engl. Bot. t. 2570.—Frond membranous, tubular, ſimple, bluntiſh, brown, finely reticulated. Seeds in little patches.—Found by Miſs Hutchins, in Bantry bay, Ireland, and by Mr. Borrer, on the Suſſex coaſt. The name is a manuſcript one of Mr. Dillwyn, who is ſaid to have been long preparing a treatiſe on *Ulva*, which, if we may judge by his excellent performance on *Conferva*, cannot but prove a great acceſſion to cryptogamic botany. Several *fronds* grow together, but apparently not connected, bearing a great reſemblance to the laſt in height, figure, and ſomewhat in colour, though darker, rather thicker, and, when cut acroſs, diſplaying a more membranous ſubſtance, which is finely reticulated throughout. The *ſeeds* moreover differ eſſentially, being collected into little irregular patches.

26. U. *rugoſa*. Corrugated Cape Laver. Linn. Mant. 311.—Frond membranous, tubular, branched, corrugated, tuberculated, dark brown; branches two-ranked, burſting at the extremity.—Gathered by Koenig in the ſea near the Cape of Good Hope. The *fronds* are four or five inches long, and about half an inch thick, beſet with many ſimple *branches*, ſpreading in two ranks, each branch from an inch and half to three inches in length, not ſo thick as the main ſtem; their point of inſertion much contracted; their extremity moſtly open and tubular; their rugged ſurface beſprinkled with ſlightly prominent, umbilicated, minute prominences, in every one of which a *ſeed* appears to be imbedded.

Sect. 3. *Frond fleſhy, ſolid.*

27. U. *diaphana*. Pellucid Fleſhy Laver. Hudſ. 570. (Alcyonium gelatinoſum; Linn. Syſt. Nat. v. 1. 1295. A. n. 5; Ellis Cor. 87. t. 32. f. *d*, *D*. Fucus ſpongioſus nodoſus; Ger. Em. 1570. Urtica marina nodoſa; Bocc. Muſ. 269. t. 5. f. 13.)

β. U. flaveſcens; Hudſ. 570. (U. diaphana; Engl. Bot. t. 263. Alga minor flaveſcens, variè diviſa; Mart. Cent. t. 32.)

Frond gelatinous, ſolid, tumid, pellucid, roundiſh or compreſſed, with numerous irregular branches.

This ſingular marine production, referred by Linnæus and Pallas to the animal kingdom, ſeems by its ſcent rather of a vegetable nature, betraying no ſigns of animal life, and having the character of an *Ulva* very apparent, in the diſtribution of what we preſume to be the ſeeds; to ſay nothing of its drying as well as any very juicy ſea-weed, though its ſubſtance is ſo extremely ſpongy and watery. The common appearance of this *Ulva*, as found on our coaſts, exactly reſembles wet ſea-ſand in colour. Its length is ſeveral inches, the main *ſtem*, which ſwells upward, being beſet with irregular ſeries of knobby branches, more or leſs acute. The very copious imbedded *ſeeds* are brown, very ſmall. Our more uncommon variety β, erroneouſly figured in Engl. Bot. as the true *diaphana*, though the deſcription comprehends both ſorts, differs from the above-deſcribed, in its pale-yellow colour, reſembling barley-ſugar (or *ſucre brûlé*); the *branches* are ſaid by Hudſon, who nevertheleſs ſuſpected it might prove but a variety, to be more obtuſe; this character however is variable.

28. U. *defracta*. Broken Laver. With. v. 4. 124. t. 18. Engl. Bot. t. 1626.—Frond thread-ſhaped, ſolid, unbranched, elaſtic, viſcid, pellucid, with pale red dots.—Found by Mr. Brodie of Brodie, on the eaſt coaſt of Scotland, and by the late colonel Velley on the beach at Weymouth, at low water. The tender delicate plants of this ſpecies grow entangled amongſt other marine vegetables, twiſted together like worms, of a very pale fleſh-colour to the naked eye; each being from two to twelve inches long, ſimple, brittle, bluntiſh, very glutinous, ſhrinking up to nothing when dried. The minute pink dots, ſcattered over the white ſurface, and preſumed to contain the *ſeeds*, change gradually to an orange hue.

29. U. *filiformis*. Thread-ſhaped Laver. Hudſ. 570.—"Frond gelatinous, thread-ſhaped, much branched, purpliſh; branches ſcattered, diſtant, very long."—Native of ſubmarine rocks and ſtones, near Chriſtchurch, Hampſhire. Annual, occurring from April to September. *Frond* ſix inches long, the thickneſs of packthread; the branches obtuſe. *Hudſon*. We are unacquainted with this ſpecies.

30. U. *capillaris*. Capillary Laver. Hudſ. 571.—"Frond gelatinous, thread-ſhaped, much branched, pale; branches alternate, capillary, acute."—Found in ſimilar ſituations with the preceding, near Chriſtchurch, and elſewhere, in Hampſhire, as well as at Margate. Annual; from May to October. The *frond* is four inches long, ſolid. *Hudſon*. This ſhould ſeem to be very little different from the laſt.

31. U. *rubens*. Reddiſh Short-branched Laver. Hudſ. 571.—Frond gelatinous, thread-ſhaped, equal, reddiſh or greeniſh, much branched; branches ſcattered, horizontal, obtuſe.—Found by Mr. Hudſon on ſubmarine rocks and ſtones, in Portland iſland, and near Pool, Dorſetſhire. Annual; from May to October. *Frond* four inches long, of nearly equal thickneſs throughout, of the diameter of ſmall packthread, divided into ſeveral alternate or ſcattered principal *branches*, each of which is beſet with numerous others, all horizontal, ſhort and blunt. Little black *ſeeds* are ſcattered under the cuticle. An authentic ſpecimen of this, and many other ſea-weeds, deſcribed by Hudſon, were given to the younger Linnæus by ſir Thomas Frankland. We are alſo poſſeſſed of another, found by the ſame gentleman at Scarborough, in Auguſt 1807, which is ſix inches high, green, with very copious branches of the ſame thickneſs as above deſcribed; the internal ſubſtance of the main *ſtem*, in the lower part, appearing very firm and horny, like a coralline. Notwithſtanding the difference of colour, we cannot doubt the identity of the ſpecies.

32. U. *rubra*. Crimſon Laver. Hudſ. 571. Engl. Bot. t. 1627.—Frond gelatinous, much branched, forked, thread-ſhaped, unequal, ſomewhat flattened, bright red, ſmooth.—Found by Mr. Hudſon, near Chriſtchurch, Hampſhire, and by ſir Thomas Frankland on the Scarborough coaſt, in Auguſt. Several *fronds*, from an inch and a half to three inches high, ſpring from a ſmall callous diſk. They are taper at the baſe, much branched and variouſly dilated, eſpecially the principal ſtem, which is moſt flattened; the ultimate diviſions forked, or aggregate. The

colour

colour of the whole is either a full or pale crimson, sometimes tawny, or slightly variegated.

33. U. *plumosa*. Feathered Green Laver. Hudf. 571. Engl. Bot. t. 2375.—Frond gelatinous, green, thread-shaped, somewhat compressed, branched; branches pinnate, with numerous, parallel, linear, shining segments.—Gathered by Mr. Hudson on the Devonshire coast; by Mr. W. Borrer at Brighthelmstone; and by Mr. Woodward at Cromer, in little rocky pools, filled daily by the sea. This species is supposed to be perennial; it occurs throughout the summer and autumn. The *fronds* are three inches high, erect; when fresh of a bright, uniform, very beautiful green; but the colouring matter soon collects towards the skin, leaving the middle part vacant, and of a glassy transparency. The *branches* are numerous; naked at their base; copiously feathered above, with crowded, two-ranked, linear, obtuse, entire segments, gradually shorter towards the point. Nothing is known of the fructification. The habit of the plant, and the mode in which the green colouring matter subsides, accord with one tribe of the *Confervæ*; but there are no joints, nor internal partitions.

34. U. *protuberans*. Prominent-seeded Laver. Engl. Bot. t. 2583.—Frond gelatinous, thick, angular, green. Seeds elliptical, at length prominent and deciduous.—Discovered by Mr. W. Borrer, growing amongst moss, on wet shady parts of the sand-rocks, at Uckfield, Sussex, in September 1813. This is so singular a production, that much doubt may arise concerning its real genus. The whole is an assemblage of thick, fleshy, juicy, angular or wrinkled, obtuse lobes, about half an inch high, of a light, pellucid, grass green. Copious elliptical uniform *seeds*, about the size of red poppy-seed, are lodged separately throughout the whole substance, the external series projecting beyond the surface, and when ripe easily separating from it if touched. According to our present state of knowledge therefore, this plant can be referred only to *Ulva*, though, like a few other species, it is not of marine origin.

Some doubtful species require to be mentioned, and of these we shall take a compendious notice.

U. confervoides, Linn. Sp. Pl. 1632. (Conferva marina fistulosa; Dill. Musc. 34. t. 6. f. 39.), has all the appearance of a branched *Conferva*, but Dillenius describes it as pervious throughout, admitting water freely along the stem and branches. Hence Linnæus made the plant an *Ulva*, but our knowledge of many *Confervæ* renders the propriety of such a determination doubtful. He adopted this species solely on the authority of the *Historia Muscorum*, what he subsequently referred to it in his herbarium being very different.

U. latissima, Linn. Sp. Pl. 1632, we have already mentioned under n. 12, as not at all different from *Fucus saccharinus*, which the original Gothland specimen clearly shews.

U. labyrinthiformis, Linn. Sp. Pl. 1633, found by Vandelli in warm baths near Padua, and described, with a good figure annexed, in that author's *Tractatus de Thermis Agri Patavini*, 120. t. 2, should seem to belong rather to *Tremella*, no *seeds* having been observed.

U. lumbricalis, Linn. Mant. 311, may be found under Mertensia.

U. papillosa, ibid. is probably a *Fucus*, near to the Linnæan *F. spinosus*, and perhaps the same with *F. striatus*, Turn. Hist. Fucor. 32. t. 16.

U. pruniformis, Linn. Sp. Pl. 1633, and

U. incrassata, Hudf. 572, are species of Rivularia; see that article.

U. granulata, Linn. Sp. Pl. 1633, is *Tremella granulata*, Engl. Bot. t. 324.

U. stellata, Wulf. in Jacq. Coll. v. 1. 351. Prodr. Fl. Græc. n. 2522, very nearly related to Lichenoides gelatinosum tenue reticulatum. Dill. Musc. 138. t. 19. f. 21, if not the very same; is likewise next akin to *Conferva umbilicata* of Col. Velley, Transf. of Linn. Soc. v. 5. 169. t. 7. These plants are so peculiar in structure, that their fructification, when discovered, will probably establish them as a genus by themselves. At least they could be referred to *Ulva*, or to *Conferva*, for the present only, nor are they reconcileable to the generic character, or habit, of either.

Ulva, in *Geography*, one of the Western islands of Scotland, about seven miles in circumference, near the W. coast of Mull. N. lat. 56° 28′. W. long. 6° 13′.

ULUA, a river of Honduras, which runs into the bay, N. lat. 15° 48′. W. long. 88° 38′.

Ulua, or *Sol*, a small island in the gulf of Mexico. N. lat. 15° 40′.

ULUBRÆ, in *Ancient Geography*, a borough of Italy, in Latium, in the vicinity of Velitræ and of Suessa Pometia: it was a Roman colony. Horace says of it (Epist. ii. v. 28.)

"———— Navibus atque
Quadrigis petimus bene vivere; quod petis, hic est,
Est Ulubris; animus si te non deficit æquus."

But we learn from Juvenal (Sat. x. v. 101.) that this place became desert:

"Et de mensura jus dicere, vasa minora
Frangere pannosus vacuis Ædilis Ulibris."

ULUCITRA, a town of Thrace, in the province of Rhodope.

ULVERSTON, in *Geography*, an ancient market-town in the hundred of North Lonsdale, and county palatine of Lancaster, England, is situated within the district of Furness, at the distance of 20 miles N.W. from the county-town, and 270 miles N.W. by N. from London. Edward I., in the eighth year of his reign, granted a charter to this town for a weekly market and annual fair: but the benefit derived from this grant was inconsiderable, while Furness abbey was inhabited by the monks, as the great mart of this district was Dalton, which, from its contiguity and connection with the abbey, superseded all the vicinal towns. After the dissolution of that monastery, Dalton lost its importance, and Ulverston, from its convenient and central situation, became the emporium of the district. The fair granted by king Edward has grown into disuse, but two others are annually held. Monday is the market-day. The principal trade of this town is in iron-ore, pig and bar iron, lime-stone, blue slate, oats, barley, and beans: the manufactures are cotton, check, canvas, and hats. Within the last sixty years, great improvements have taken place in the appearance of the town; the streets are spacious and clean; and the houses, which, from the advance of trade, rapidly increase in number, are well built: in the return of the year 1811, they were estimated at 728, the population at 3378. At the intersection of two principal streets, in the centre of the most ancient part of the town, is an old cross. The church, which stands in a field at a small distance from the town, was almost wholly rebuilt in 1804: it is a plain, neat edifice; has three aisles and a square tower. A small theatre, an assembly-room, and a public subscription library, have been recently established. A canal, about a mile and a quarter in length, was cut in 1795, to form a communication from the

the east side of the town to the channel of the river Leven: it is well supplied with water, has a spacious basin, with a warehouse, and has been navigated by ships of 400 tons burden. It was made after the plans of J. Rennie, esq.

In the vicinity of this town is Conishead, the seat of Wilson Bradyll, esq. The house stands on the scite of the ancient priory of Conishead: the south front is modern, with an ornamental arcade; the north front has a piazza and wings.

About half a mile from Ulverston is Swartmoor-Hall, to which some degree of celebrity has attached from its having been the residence and property of George Fox, one of the founders of the sect of Quakers. He made a convert of the former proprietor, Thomas Fell, one of the Welsh judges, and married his widow. Fox died in 1691.—Beauties of England and Wales, vol. ix. Lancashire, by J. Britton, F.S.A.

ULUGH-BEIGH, in *Biography*, a learned and powerful Tartarian prince, was born in the year 1393. He was the grandson of the celebrated Timur; and his real name was Mohammed Taragai, Ulugh-Beigh being an epithet which signifies a great lord or prince. He entered upon the government of Iran and Turan, that is of Persia and Tartary, during his father's life, in 1407, and conducted himself in a manner that secured universal esteem. His leisure hours he devoted to reading, and thus acquired a knowledge of various sciences. He was famed for a very retentive memory, and having written a book or journal of all the animals which he had killed in hunting, which book was accidentally lost, he dictated the contents of it to a transcriber; and upon comparing this transcript with the original when it was found, it was correct except in four places. Among other institutions for the promotion of science, he established a gymnasium at Samarcand, his capital, which accommodated a hundred students, received into it for education. His chief attention, however, was devoted to mathematics and astronomy; and for the improvement of the latter science, he invited to Samarcand a great number of astronomers, and constructed an observatory, which he furnished with the best astronomical instruments. Here he assisted in person, employing in his observations, as some have said, a gnomon one hundred and eighty Roman feet in height. His principal assistant was Salah-Eddin, his preceptor, and a Christian, who was the director of this astronomical academy, and who co-operated with Ulugh-Beigh in the construction of the tables which he intended to publish; but as he died before their completion, the prince himself engaged in the laborious undertaking, and selected for his coadjutors Alicushi, the son of Salah-Eddin, and the astronomer Ali Ben-Gaïat-Eddin Mohammed Jamchid. To this work, which has never been printed entire, we are indebted for those tables that pass under the name of Ulugh-Beigh. A fourth part of it was published by the learned Hyde, with an ample commentary. This was a catalogue of the fixed stars, formed upon the Observations made at Samarcand, and completed in 1437. Its title is "Tabulæ Longitudinis et Latitudinis Stellarum fixarum, ex Observatione Ulugbeighi, Tamerlanis M. Nepotis, Regionum ultra citraque Gihun (Oxum) Principis potentissimi, ex tribus invicem collatis MSS. Persicis, jam primum luce et latio donavit, et Commentariis illustravit, Thomas Hyde, A. M. e Coll. Regin. Oxon.; in calce accesserunt Mohammedis Tizini Tabulæ Declinationum et Rectarum Ascensionum. Additur Elenchus Nominum Stellarum," Oxon. 1665, 4to. These astronomical tables were scarcely completed, when a difference occurred between Ulugh-Beigh and his eldest son. Addicted, like other orientals, to astrology, he calculated his son's nativity; and hence portending some great misfortune, he gave the preference to his younger son, so that the eldest, being slighted, rebelled against him. A civil war took place, and in a bloody battle near Samarcand the father was defeated, and was obliged to save himself by flight. Returning afterwards to Samarcand, hoping that his son would have compassion upon him, he was at first kindly received; but soon afterwards a mandate was issued for his execution, which tragical event occurred near Samarcand, according to Flamstead, in the year 1449; but, as Herbelot says, in 1450.

Two other learned works, which serve for the illustration of the eastern geography and history, written by this prince, were published by Mr. Greaves; *viz.* "Binæ Tabulæ Geographicæ, una Nassir Eddini, altera Ulug-Beighi, Opera et Studio J. Gravii nunc primum publicatæ et Commentariis ex Abulfeda aliisque Arabum Geographis illustratæ," Lond. 1648, 4to.: and also "Epochæ celebriores Astronomis, Historicis, Chronologis, Chataiorum, Syro-Græcorum, Arabum, Persarum, Chorasmiorum usitatæ; ex Traditione Ulug-Beighi Indiæ citra extraque Gangem Principis, eas primum publicavit, recensuit, et Commentariis illustravit J. Gravius," Lond. 1650, combined, in Arabic and Latin, in J. Hudson Geogr. Vet. Script. Minores, tom. iii. Montucla. Gen. Biog.

ULVISON, in *Geography*, a river of Sweden, which runs into the Mæler lake.

ULULA, in *Ornithology*. See STRIX.

ULULEUS, in *Ancient Geography*, a river which furnished Dyrrhachium with water; now called Argentea.

ULYSSEA, a town of Hispania, in Bœtica, situated on the mountains, above Abdera, according to Strabo; who says that here was a temple dedicated to Minerva, and that it contained many monuments of the voyages of Ulysses.

ULYSSES, in *Geography*, a township of New York, in America, in the S.E. corner of Seneca county, 14 miles S.E. of Ovid, and 180 W. of Albany, with two post-offices, Ithaca and Trémain; bounded N. by Ovid, N.E. and E. by Cayuga county, S. by Cayuta in Tioga county, and W. by Hector. On the E. it embraces the half of the S. end of Cayuga lake, an extent of eight miles, where it receives Cayuga creek, or the main inlet; Six-mile and Fall creeks, which furnish many mill-seats in this part of the town; and it has some small streams that fall into the W. side, and supply mill-seats in the N. part of the town. The south part is hilly, and the soil less valuable than the north, which is sufficiently level, with a very good soil. It has been settled since the year 1789, at first by Yankees, or New England people, and since by Dutch from New Jersey. It has one Methodist meeting-house, and a congregation of Presbyterians. The town has a considerable quantity of white pine, which is very valuable. Ithaca is a handsome post-village at the S. end of Cayuga lake, containing 40 houses, with a considerable trade; and Tremain is a post-village, 11 miles N.W. of Ithaca, containing 10 or 12 houses.

ULYSSIS PORTUS, in *Ancient Geography*, a port on the eastern side of Sicily, near Catana. It was an ancient opinion that Ulysses had landed in this place. However, if we admit the recitals of Homer in the Odyssee, Ulysses had landed on the promontory of Pachynum.

ULYSSOPOLIS, a town of Thrace, said to be the Odissus of Ptolemy.

ULZEN, in *Geography*. See ULTZEN.

UMA, in *Mythology*, a name of the Hindoo goddess *Parvati*,

Parvati, under which article an ample account is given of this important many-named deity. Uma is ftated to be an incarnation of Parvati.

Uma is a name ftill given to Hindoo females, in common with feveral others of this and other goddeffes; fuch as Lakfhmi, Parvati, Bhavani, &c.

UMAGNO, in *Geography*, a town of Etruria; 5 miles N. of Volterra.

UMAGO, a fea-port town of Iftria. Here is a fpacious harbour at the mouth of a river, but the fituation being unhealthy, the town is but thinly inhabited; 16 miles E. of Venice. N. lat. 45° 35′. E. long. 13° 43′.

UMAPA, a town of Mexico, in the province of Culiacan; 10 miles E. of Culiacan.

UMARI, in *Botany*, the Brafilian name of a tree, rudely figured in Marcgrave's *Hift. Plant.* 121. See GEOFFRÆA.

UMARRAH, in *Geography*, a town of Nubia; 85 miles S. of Syene.

UMATAG, or UMATAY, a town of the ifland of Guam, in the Eaft Indian fea, where veffels ftop to refit.

UMBA, a town of Ruffia, in the government of Archangel, on the White fea. N. lat. 66° 45′. E. long. 29° 14′.

UMBA, *Lower*, a middle province of Matamba.

UMBA, *Upper*, the moft northerly province of Matamba.

UMBAA, a town of Abyffinia; 100 miles S.S.W. of Gondar.

UMBAGOG LAKE, a lake of New Hampfhire. N. lat. 44° 38′. W. long. 70° 59′.

UMBALLA, a town of Hindooftan, in the circar of Sirhind; 32 miles E.S.E. of Sirhind.

UMBEL, UMBELLA, in *Botany*, a Latin word, for a little fhade, or umbrella, is ufed to defignate a particular mode of inflorefcence, thence called umbellate. (See UMBELLATÆ.) The *umbella* was formerly named in Englifh *rundle*, probably from its *round* fhape; but *umbel* is now univerfally adopted. This mode of inflorefcence confifts of feveral flower-ftalks, or rays, nearly equal in length, fpreading from a common point or centre, their fummits forming a level, convex, fometimes globofe, furface; more rarely, as in the Carrot, a concave one. When each ray is fimple, and bears a folitary flower, the umbel is denominated fimple, as in the Ivy and Cowflip, as well as in *Aftrantia*, *Eriocalia*, and *Hydrocotyle*. A compound umbel, properly fo called, has each of its principal rays terminating in another fmaller umbel. Such, at leaft, is the cafe with thofe plants conftituting the natural order of UMBELLATÆ; few of which, befides the three genera juft mentioned, have fimple umbels. Inftances of compound ones are familiar in the Hemlock, Carrot, Parfley, &c. There are indeed other kinds of compound umbels, found in various other tribes of plants; as in *Euphorbia*, whofe general umbel, in moft of the fpecies, is repeatedly fubdivided, either in a threefold, or a forked manner. A CYME (fee that article) is in the firft inftance a general umbel, though its partial ftalks are irregularly fubdivided. On the contrary, a panicle, whofe primary ramifications are alternate, or irregular, fometimes has its ultimate ones umbellate, of which examples occur in *Vitis* and *Aralia*. We refer the reader to CYME, INFLORESCENCE, and GENUS, for remarks on the different conceptions of authors, refpecting the nature of an umbel, referving further confiderations of that kind for the article UMBELLATÆ. We have here only to add, that an umbel is fometimes naked, but much more generally accompanied by *bracteas*, or by a fimple or compound *involucrum*, not always conftant, or uniformly prefent, even in the fame fpecies. The rays themfelves are ufually permanent, feldom deciduous, till long after the feeds have fallen.

UMBELLATÆ, a very natural order of plants, fo named from its mode of inflorefcence, (fee UMBEL,) and conftituting the forty-fifth order among the *Fragmenta* of Linnæus. It is exactly equivalent to the *Umbelliferæ* of other writers, at leaft of fuch as are correct, being the fixtieth order in Juffieu's fyftem, or the fecond of his twelfth clafs. The characters of that clafs are thefe. A fuperior *calyx* of one leaf. *Petals* feveral, definite, inferted upon the piftil, or upon the border of a gland crowning the germen. *Stamens* definite, diftinct, inferted into the fame part, being alternate with the petals, and equal to them in number. *Germen* inferior, fimple; ftyles feveral, definite; ftigmas as many. *Seeds* agreeing in number with the ftyles, either naked, or rarely inclofed in a feed-veffel, having a fimilar number of cells. *Corculum* minute, oblong, at the top of a woody albumen. *Flowers* umbellate, that is, fupported fingly on numerous ftalks, fpringing from the fame point. *Umbel* either naked, or furrounded by a many-leaved involucrum: and either fimple, or compofed of leffer, or partial, umbels, which likewife are fometimes naked, fometimes furnifhed with a partial involucrum. The orders are two; 1. ARALIÆ, whofe *petals*, *ftyles*, and *feeds*, are numerous, their *fruit* capfular or pulpy: and 2. UMBELLIFERÆ, of which we are about to treat.

Juffieu thus diftinguifhes the order in queftion. *Calyx* either entire or five-toothed. *Petals* five. *Stamens* five. *Styles* and *ftigmas* two. *Fruit* perpendicularly feparable into two *feeds*, various in fhape, hanging by their fummits to a central, thread-fhaped, often deeply divided, axis or receptacle. *Flowers* difpofed in little umbels, which are moftly collected into general umbels, each being either naked or furnifhed with involucrums, and for the moft part regular, in a few inftances anomalous. The *ftem* is often herbaceous, rarely fhrubby. *Leaves* alternate, with fheathing footftalks; and either fimple, or moft frequently compound, with repeated fubdivifions. The colour of the *flowers* is ufually white, fometimes reddifh or purplifh; in a few inftances yellow. *Lagoecia*, and we may add *Eriocalia*, are remarkable for a folitary feed, the ftyle alfo being folitary in the former. We may add alfo, that *Eryngium* is fingular for having the umbel condenfed into a head, the flowers having no footftalks, forming the only exception to the umbellate inflorefcence of the whole order.

Linnæus fixes the character of his *Umbellatæ* in the five ftamens, two ftyles, and two feeds, all umbellate flowers not being comprehended therein. But as *Eryngium* is not excluded, though deftitute of a proper umbel, fo neither are *Lagoecia* and *Eriocalia*, though having only folitary feeds. His general idea of the order agrees with Juffieu's, but he held a peculiar opinion of the umbel being in itfelf an aggregate flower. On this fubject we have already faid all that is neceffary, under CYME. We proceed to the generic diftinctions in this order, a fubject of the greateft difficulty, becaufe the order itfelf is fo very natural. The fpecies, as Haller obferves, are eafily difcriminated. This author, and his pupil Crantz, follow Tournefort, in defining the genera by the feeds. Linnæus holds this principle rather too cheap, adopting the plan of his friend Artedi, who firft fuggefted the ufe of the general and partial involucrum for the purpofe required. Hence he diftributes the *Umbellatæ* into three fections. Thofe which have a general as well as partial involucrum; thofe which have only a partial one; and thofe which have neither. Juffieu follows the fame arrangement, only reverfing the fections. The author of the *Flora Britannica*

tannica has not undertaken to reform this subject, though he has always objected to the principle on which it is founded. Like other Linnæan botanists, he adopts it, with many things besides, for present use. Gærtner, as might be expected, recurs to the seeds, but not with the happiest success.

Two ingenious writers have of late taken up this department of botany afresh, independent of each other; professor Hoffmann, late of Gottingen, now of Moscow; and professor Sprengel of Halle. The former founds his genera on the seeds and petals; the latter on the seeds alone, carrying into execution the principles of the late M. Cusson of Montpellier, whose premature death deprived the world of the fruit of his laborious studies on this subject.

Mr. Sprengel's sections are as follows. 1. Fruit compressed, flat. 2. Fruit rather solid, winged. 3. Fruit bladdery. 4. Fruit coated. 5. Fruit armed. 6. Fruit solid, naked. This last section is subdivided into those whose fruit is linear-lanceolate, and those in which it is oblong-ovate, or quite ovate. Subordinate characters are afforded by the ribs of the seeds, and their interstices, which, after Cusson, are termed *valleculæ*. *Latuscula* of these authors are the sloping sides of each seed, from the back to the *commissura*, or seam, where the edges of the two seeds meet. Professor Sprengel establishes 63 genera, and 371 species, in his *Prodromus*, published at Halle in 1813.

The *Umbellatæ* hitherto known are chiefly found in the temperate climates of the northern hemisphere, as Mr. Brown observes in his General Remarks on the Botany of Terra Australis, subjoined to captain Flinders's Voyage. Very few occur within the tropics, but the eminent botanist just quoted informs his readers, that those of Terra Australis, including a few *Araliæ*, exceed fifty species. These are mostly new. The singular genus ERIOCALIA, (see that article,) adopted in Sprengel's Prodr. 27, is one of them. Mr. Brown speaks of another genus, by the name of *Leucolæna*, "worthy of notice on account of the great apparent differences of inflorescence, existing among its species;" which, however, prove, by his luminous explanation, to be only *apparent*.

We think it hardly necessary to mention the polygamous character of the flowers in some of this order, though that character is made to enter into the Linnæan generic distinctions. The central flowers, or central partial umbels, are most inclined to be male, the surrounding ones female, or at least most fertile. The petals of the latter are also most radiant, or dilated outwards.

Linnæus remarks, that the principal qualities of these plants reside in their roots, (often biennial,) and their seeds; the herbage, for the most part, being inactive. They contain an acrid aromatic, or caustic principle. Such as grow in dry places are most wholesome or safe, as well as most agreeable in flavour; those found in watery places are among the most virulent of all vegetable poisons; witness *Cicuta virosa* and *Oenanthe crocata*. Cultivation, in a dry or manured soil, renders some aquatic *umbellatæ* safe and wholesome, particularly the *Apium graveolens* of our ditches, which becomes, under proper treatment, the garden Celery.

UMBELLIFERÆ. See UMBELLATÆ.

UMBELLIFEROUS PLANTS, a name given to certain kinds, as all such as form and produce their flowers in the manner of an umbel, and which are principally of the herbaceous kinds, with some few of the tree sort, having the flowers in this mode either in the simple or compound form, rising with erect hollow stalks in the first description, and mostly branching in the alternate method, and either simple-fingered, or winged. The chief sorts in the garden herb class are those of angelica, the different carrot kinds, the parsnip, parsley, the various kinds of celery, common fennel, dill, giant fennel, alexanders, coriander, carraway, Macedonian parsley, samphire, eringo, &c. But besides these esculents for different culinary purposes, it belongs to some of the medicinal sort, and others which do not relate to the business of gardening. See KITCHEN-*Garden Plants*, and MEDICINAL *Plants*.

UMBELLUS, in *Ornithology*, a species of *Tetrao*; which see.

UMBER, OMBROS, or *Umbros*, in *Ancient Geography*, a lake of Italy, in Umbria; which, according to Scaliger, is the same with the Vadimonis lacus of Livy.

UMBER, or *Umbre*, in *Natural History*, a fossile brown or blackish substance, used in painting, so called from Ombria, the ancient name of the duchy of Spoleto, in Italy, whence it was first obtained; diluted with water, it serves to make a dark-brown colour, usually called with us an hair-colour.

Dr. Hill and M. Da Costa consider it as an earth of the ochre kind. It is found in Egypt, Italy, Spain, and Germany; in Cyprus also it is found in large quantities; but what we have brought into England is principally from different parts of the Turkish dominions. But it might be found in considerable plenty also in England and Ireland, if properly looked after, several large masses of it having been thrown up in digging on Mendip-hills, in Somersetshire, and in the county of Wexford, in Ireland: it is also sometimes found in the veins of lead-ore, both in Derbyshire and Flintshire.

Mineralogists mention two kinds of umber; the one called "Cologne earth," which is a variety of peat or earthy-brown coal. In the vicinity of Cologne they work large beds of it, principally for fuel, and a considerable quantity is imported into Holland, where it is used for the adulteration of snuff, and a smaller quantity is employed by the paint-makers. Its colour is a somewhat pinkish-brown, and it is useful to the painter in water-colours. The second kind is known by the name of "Turkish umber," and appears to be a variety of the iron-ore, called brown iron-stone ochre. Klaproth analysed a specimen from Cyprus, and found that it contained

48	oxyd of iron.
20	oxyd of manganese.
13	silex.
5	alumine.
14	water.
100	

Wallerius ranks the umber as a humus or mould, apprehending, by its immediately flaming in the fire, and by the smell which it emits, that it owes its colour to an admixture of bituminous parts. But M. le Baron de Hupsel (Berlin, Mem. 1771) has discovered it to be a fossile wood, filled with a bituminous juice. It is found in two different states, first, as retaining the form of wood, which it has preserved by means of a bituminous matter that has prevented the rotting of the wood; and secondly, as a powder, like that into which the first kind, that still retains the form of the wood, easily crumbles.

It is certain, however, says Mr. Kirwan, that the name hath been also given to a sort of brown ochre, which becomes

comes red when slightly heated, but in a stronger heat is again brown and magnetic, and in a still stronger, melts into a black glass. It does not effervesce with acids before roasting, but after that the martial part is soluble. Elem. Mineral, p. 78.

This substance, when burnt, makes a good shade for gold. It need only be put into the naked fire in large lumps, which should not be taken out till they be thoroughly red-hot.

Umber, or *Ombre*, in *Ichthyology*, an English name for a fish of the truttaceous kind, more commonly called the *grayling*, and by the authors in ichthyography, *thymallus*, a fresh-water fish of a very fine taste.

UMBERPATTONS, in *Geography*, a town of Hindoostan, in Boggilcund; 20 miles S.S.W. of Rewah.

UMBERSTON Creek, a river of Virginia, which runs into the Potomack, N. lat. 39° 35′. W. long. 78° 6′.

UMBILICAL, in *Anatomy*, an epithet applied to the arteries and veins which pass through the umbilicus. See Embryo.

Umbilical *Region*, is that part of the abdomen lying round the umbilicus, or navel.

Umbilical *Rupture*, a rupture or protrusion of the bowels at the navel. The disease is frequently called by surgeons *exomphalos*; which see. See also Hernia.

Umbilicalis *Funiculus*, popularly called the *navel-string*. See Embryo, Funis, and Labour.

Umbilical *Points*, in *Mathematics*, the same with *foci*. See Focus.

Umbilical *Vessels of Vegetables*, in *Agriculture* and *Gardening*, a term lately applied by some writers, as Darwin, to the small vessels which pass from the heart part of the seed into the side seed-lobes, and there imbibe the solution of saccharine, farinaceous, or oily matter, which is prepared and deposited in them for the nourishment and support of the *new* vegetable in its germination and infant growth. They are consequently supposed to perform the important office of supplying nutrition to the young plant, and of oxygenating, or affording the oxygene principle of the air to the vegetable juice, sap, or blood, and thereby to be of very material use in the sprouting and vegetation of grain, seeds, and buds. See Vegetation, and Vital *Air*.

UMBILICARIA, in *Botany*, a genus of the *Lichen* family, so called by Hoffmann, from the rounded depressed figure of its frond, whose centre is firmly attached to the rocks, by a central root, like an umbilical cord. This genus consists of the *Lichenes umbilicatæ* of Linnæus, and is now called Gyrophora; see that article. Nineteen species are described in the most recent publication of professor Acharius, *Synopsis Methodi Lichenum*, p. 63—69.

UMBILICATED, in *Gardening*, a term which signifies and is applied to those sorts of fruit and leaves which are navel-shaped, or formed in the manner of that part. This is the case in fruit of the apple and pear kinds, as well as some others, in which one or both ends are hollowed in a navel-like manner. Also in some leaves, as those of the peltate or target-formed sort, which are fashioned or shaped in a manner somewhat similar to that of the navel, at the part or place where the footstalk is inserted, which is commonly about the middle, on the under side, but in some instances above.

UMBILICUS, in *Anatomy*, the navel, a round opening in the linea alba, for the passage of the umbilical vessels of the fœtus. Its situation is marked by a depression, after the cord has separated, produced by the inflection of the integuments. See Obliquus.

Umbilicus, in *Mathematics*, the same with *focus*.

Umbilicus *Marinus*, a name given to a small oval body of a shelly matter, from its resemblance to the human navel. It is properly the operculum of a shell-fish, serving to close up the aperture of the shell in the buccinum, and other turbinated shells; and to that purpose it is fixed to the anterior extremity of the body of the animal; so that when it retracts its body into the shell, this naturally fills up the mouth of it: it is convex on one side, and flat on the other; the convex side is plain and white, the flat side is yellowish or reddish, and marked with a spiral line. See Conchology.

It is said by authors to have great virtues as an absorbent and astringent; but it is not used at present in the shops, though it holds a place in the catalogues of the Materia Medica, as well of our own as other nations.

Umbilicus *Veneris*, in *Botany*. (See Cotyledon.) The English name of the same import, Venus's Navel-wort, is applied to the *Cynoglossum linifolium*, on account of the little hollow, or depression, in each of its beautiful seeds.

UMBINUS, among the *Ancients*, a kind of coin current in Gallia Narbonnensis.

UMBLA, or, as some write it, *Umbra*, in *Ichthyology*, the name of a fish of the truttaceous kind, and nearly allied to the salmon.

It is the *salmo umbla* of Linnæus, with the lateral lines bent upward, and a bifurcated tail. See Salmo.

There are four species of this fish mentioned among naturalists; but the *umbla prior* and *umbla altera* of Rondeletius, which are two of them, seem only to be the different sexes of the same fish. These are considerably large, very like the common salmon, but have blue backs and yellow bellies. The third is the fish commonly called the *salvelin*, or *salmo salvelinus* of Linnæus, with the upper jaw longer than the other: and the fourth is the *red charr*. Willughby's Hist. Pisc. p. 198.

UMBO, in *Antiquity*, the round protuberant part of a shield.

Umbo, in *Geography*, a lake of Russia, in the government of Archangel. N. lat. 67° 40′. E. long. 29° 14′.

UMBONE, or Horn, among *Florists*, signifies any pointed style, or pistil, in the middle of a flower.

There is also an umbone called *double-pointed*, or *biparted*, as in the pæony; and sometimes the umbone has four sharp points, in which case it is termed, an umbone divided into so many heads, or cut into three or four parts.

UMBOYNA, in *Geography*, a town of Nubia; 50 miles S. of Goos.

UMBRA, Shadow. See Light, Shadow, Penumbra, &c.

Umbra, in *Ancient Geography*, a small river of Italy, in Etruria.

Umbra, in *Geography*, a river of America, which runs into the Wabash, N. lat. 38° 38′. W. long. 88° 12′.

Umbra, in *Ichthyology*, the name of a sea-fish caught in the Mediterranean, and brought to the markets in Italy and other places; called by some *chromis*, and by the Venetians *corvo*.

Its usual size at market is about twelve or fourteen inches in length; but it grows to sixty pounds weight, and to the length of five or six feet. It is of a somewhat flatted figure, and its back is ridged and rises up from the head. It something resembles the carp in its general figure, but is broader. It is very elegantly coloured, for there are a number of long oblique lines covering its whole sides, which are alternately of a fine pale blue, and a beautiful yellow. Its scales are moderately large, and its coverings of the gills, and great part of its very head, as well as its body, are covered with these; its head is moderately large, but its mouth small, and it

it has a single beard hanging down from its chin. Rondelet. de Pisc. p. 182. See SCIÆNA.

UMBRA, in *Zoology*, a species of lacerta. See LIZARD.

UMBRATILIS PUGNA, the fighting with one's own shadow.

This was one of the kinds of exercise much recommended by the ancient physicians; they ordered the person who used it, not only to box, but to wrestle, with his shadow; that is, not only to use his arms, but his legs also, and often to put himself into a leaping posture, and throw his body violently forward, and often to retreat hastily backwards. The custom seems to have been of ancient date; Plato expressly mentions it, and St. Paul seems to allude to it in the passage where, glorying in the reality of his conflicts, he says he does not fight as one who beats the air. The physicians greatly recommended this exercise to people of sedentary lives, and to those who had weak nerves, and were afflicted with tremors. They esteemed it useful also in diseases of the kidneys, and of the thorax.

UMBRE, in *Mineralogy*. See UMBER.

UMBRE, in *Ornithology*. See SCOPUS.

UMBRELLA, in *Rural Economy*, a well-known shade or guard from the sun or rain, formed by stretching silk, canvas, or any other linen or woollen stuff, over elastic strips of whalebone, so disposed as to diverge from a central point and make a circular covering, which may by means of a rod or staff passing through the centre be held over the head, when occasion requires it, or which may be drawn up round this rod and conveniently carried in the hand. These temporary guards from heat or wet have not long been introduced into our country, but they have been found so convenient and useful that they are now become very common. They seem to have been of much more ancient use in the East. M. de la Loubere, who was envoy extraordinary for the French king to the king of Siam, in the years 1687 and 1688, informs us in his "New Historical Relation of the Kingdom of Siam," a translation of which into English was printed at London in 1693, that the use of umbrellas, in Siamese Roum, was a favour which the king of Siam did not grant to all his subjects, although the umbrella be permitted to all the Europeans. Those which are like to ours, or which have only one round, were the least honourable, and were used by most of the Mandarins. Those that had more rounds about the same handle, as if they were several umbrellas fixed one upon another, were for the king alone. Those which the Siamese called "clot," and which had only one round, having two or three painted cloths suspended from them, one lower than the other, were granted by the king of Siam to the "Sancrats," or superiors of the "Talapoins." Those which he gave to the king's ambassadors were of this last sort, and had three cloth hangings. The Talapoins had umbrellas in the form of a screen, which they carried in their hands. They were formed of a kind of palmetto leaf cut round and folded, and the folds were tied with a thread near the stem, and the stem was made crooked like an S, and served for a handle. In the Siamese language they called them "Talapat," and it is probable, says Loubere, that from hence comes the name of "Talapoi" or "Talapoin," which is in use only among foreigners, and which is unknown to the Talapoins themselves, whose Siamese name is "Tchaou-cou."

An umbrella, held in a proper position over the head, may serve to collect the force of a distant sound by reflection, in the manner of a hearing-trumpet; but its substance is too slight to reflect any sound very perfectly, unless the sound fall upon it in a very oblique direction. The whispering gallery at St. Paul's produces an effect nearly similar, by a continual repetition of reflections. Mr. Charles's paradoxical exhibition of the invisible girl has also been said to depend on the reflection of sound; but the deception is really performed by conveying the sound through pipes, artfully concealed and opening opposite to the mouth of the trumpet from which it seems to proceed. Young's Philosophy.

UMBRELLA-*Tree*, in *Gardening*, the common English name of a very ornamental tree. See MAGNOLIA.

UMBRETTA, in *Ornithology*. See SCOPUS.

UMBRIA, in *Ancient Geography*, a large country of Italy, bounded on the N. by a part of Gallia Cispadana, on the N.E. by the Adriatic gulf, on the E. by Picenum, and on the W. by the Apennines, which separated it from Etruria. This country, which was very mountainous, contained in its northern part the Senonois. It was divided into two parts by the Apennines, and took its name, as some have said, from the Greek Ομβρος, *Imber*, because, as they say, without sufficient reason, rain inundates this country. Propertius says of it:

> "Proxima supposito contingens Umbria campo
> Me genuit terris fertilis uberibus."

Ptolemy mentions several towns as belonging to this country, the names of several of which are now unknown. To the N. of this country lies the Rubicon, which serves as a boundary to Italy, properly so called.

UMBRIA, in *Geography*. See SPOLETO.

UMBRIATICO, a town of Naples, in Calabria Citra, the see of a bishop, suffragan of St. Severina; 57 miles E. of Cosenza. N. lat. 39° 27′. E. long. 17° 6′.

UMBRINO, in *Ichthyology*, a name used by some authors for the *coracinus*, or *umbra*, as some call it. The umbrino has by some been esteemed a distinct species of fish from the coracinus; but they seem to differ no other way than as the one is the older, the other the younger fish. Willughby's Hist. Pisc. p. 330.

UMBRO, OMBRO, or OMBRONE, in *Ancient Geography*, a river of Italy, in Etruria, commencing N.E. of Sena, and discharging itself into the sea near Rusellæ.

UMBUNCULUS, in *Natural History*, a name given by ancient authors to the small prominences on the surfaces of certain stones. It was originally derived from the word *umbo*, which expresses the prominent knob, or round lump in the centre of a shield; and its first use that we find in the naturalists is, in expressing a very similar thing; that is, the prominent part of the zmilampis. This was a stone of the nature of what we call *oculis beli*, or *bellochio*, and was of a white ground, and roundish figure, somewhat resembling an eye. It was found in the Euphrates, and other rivers, and had always an umbunculus of a glaucous or blueish colour. This umbunculus was a prominent round spot, such as we see in our *oculi beli*, and call the *pupil*. It was afterwards used to express the inequalities on the surfaces of flints and agates, which frequently are roundish and obtuse, and represent a kind of umbones.

UMDOOM, in *Geography*, a town of Nubia; 10 miles N. of Chiggré.

UMEA, a sea-port town of Sweden, in West Bothnia, at the mouth of a river of the same name, in the gulf of Bothnia, built by Gustavus Adolphus, with a good harbour. This town was twice burned by the Russians in the beginning of the 18th century. N. lat. 63° 52′. E. long. 20° 4′.

UMEABY, a town of Sweden; 60 miles N.W. of Umea.

UMELHEDEGI, a town of Africa, in the country of Tafilet; 66 miles S.W. of Sugulmessa.

UMELHEFEL, a town of Africa, in the country of Tafilet; 40 miles S.W. of Sugulmessa.

UMEMGIVEAIBE, a town of Africa, in the kingdom of Fez.

UMENAK, an island on the W. coast of East Greenland. N. lat. 60° 35′. W. long. 45° 30′. — Also, an island on the S.W. coast of East Greenland. N. lat. 59° 43′. W. long. 43° 20′.—Also, an island near the W. coast of West Greenland. N. lat. 61° 55′. W. long. 48° 25′.

UMIAK, a river of Russia, which runs into the Viatka, 20 miles S. of Marmalisch, in the government of Kazan.

UMMA, or AMMA, in *Ancient Geography*, a town of Palestine, in the tribe of Asher. Josh. xix. 30.

UMMANTZ, in *Geography*, a small island in the Baltic, near the W. coast of the island of Rugen. N. lat. 54° 30′. E. long. 13° 14′.

UMMENDORF, a town of Westphalia, in the duchy of Magdeburg; 24 miles W. of Magdeburg.

UMMERSTADT, a town of the principality of Coburg; 5 miles W. of Coburg.

UMPIRE, a third person, chosen to decide a controversy, left to an arbitration, in case the arbitrators cannot agree. See ARBITRATOR.

Minshew supposes the word formed of the French *un père, a father*. Some call him a *sur-arbitrator*.

UMPLE, in our *Statutes*, signifies fine linen. 3 Ed. IV. cap. 5. Blount.

UMREVISKOI, in *Geography*, a town of Russia, in the government of Tobolsk, on the Oby; 88 miles S.W. of Tomsk.

UMRITA, or AMRITA, the Sanscrit name of a precious elixir, that, according to Hindoo fabulists, confers immortality on those who quaff it. This word, and the legends connected with it, remind us strongly of the Ambrosia of Western poets. There can, indeed, be little doubt of a common derivation, or of one being borrowed from the other. In the Sanscrit language its root is traceable to *mrit*, meaning mortality: *a* being a privative particle. Immortal is, therefore, a strict translation of the compound.

With the Hindoos, as with the Greeks, the subject of this article furnishes an endless source of poetical allusion. Both people had the notion that the moon was a vase of this quintessence, which both sometimes confound with amber and ambergris. (See SOMA.) Under our article KURMAVATARA, a brief relation is given of the churning of the ocean by gods and demons for the purpose of recovering the beverage of immortality, which appears to have been lost by the iniquities of the antediluvian world. For farther information as to the fabulous origin and history of the Amrita, we refer to the notes to Wilkins's Gita, and the second article of the 11th vol. of the Asiatic Researches, by major Wilford.

When the gods shared among themselves the precious things gained in the churning process above alluded to, Indra, regent of the firmament, obtained the Umrita, hence probably the name of his city Umravati; for we find several places still similarly named: Umrapura, the metropolis of Ava (see AVA); Umritsir, or Amritsar, the capital of the Sikh nations, and others, might be instanced. Perhaps too the cave and village of Amboly, on the island of Salsette, may be hence derived. This beautiful cavern temple is fast mouldering to decay, and no good description of it has yet been given. There is also a respectable town about 40 miles S.E. from Poonah called Amravaty.

UMRUT, in *Geography*, a town of Hindoostan, in Guzerat; 18 miles E. of Pernalla.

UMSEQUIR, a town of Africa, in the desert of Barca; 20 miles E. of Siwah.

UMSTADT, a town of Hesse Darmstadt; 10 miles E. of Darmstadt.

UNA, in *Ancient Geography*, a river of Africa, in Mauritania Tingitana, the mouth of which, according to Ptolemy, is between Suriga and the outlet of the river Agna.

UNA, in *Geography*, a town of Hindoostan, in Guzerat; 20 miles S.S.E. of Chitpour. — Also, a town of Brasil, in the government of St. Paul; 50 miles S.E. of St. Paul.

UNADILLA, a post-township of America, in New York, situated in the extreme southern angle of Otsego county, 100 miles S. by W. from Albany; bounded N. by Butternuts and Otego; E. by Otego; S.E. by Susquehanna river, or the county of Delaware; and W. by the Unadilla, or the county of Chenango. Its area is supposed to be about 65 square miles. The surface is hilly and uneven, but along the streams that form the boundaries, and also some smaller ones, the land is very good and productive. The uplands and hills also afford fine grazing and meadow lands. Several small streams furnish mill-seats, which are numerous. Here are a quarry of stones used for grinding, sixteen saw-mills that prepare lumber conveyed to the Baltimore market on rafts upon the Susquehanna, five grain-mills, an oil-mill, and other water-works, and five distilleries of whiskey. Here are one episcopal church, and fourteen school-houses. In 1810, the whole population consisted of 1426 persons, with 116 senatorial electors, 341 taxable inhabitants, and 141,896 dollars of taxable property.

Unadilla Village is pleasantly situated on the Susquehanna, and contains an episcopal church and 30 dwellings, besides stores, &c.

UNALASHKA. See OONALASHKA.

UNALGA, one of the Fox islands; 15 miles S.E. of Unalashka.

UNAMAK. See OONAMAK.

UNAMIS, a tribe of Delaware Indians.

UNAMPELLY, a town of Hindoostan, in Mysore; 15 miles S.W. of Gooty.

UNANIMITY *of Juries*. See JURY.

UNANNEALED BOTTLES, or *Bologna Bottles*, a kind of unannealed glass bottles made at Bologna, and many other places, in the year 1742, which, though appearing very strong, yet are to be broken by a fragment of flint, scarce larger than a grain of sand, thrown into them. See *Annealing of* GLASS.

UNARA, in *Geography*, a river of South America, which serves for a line of division between the governments of Caraccas and Cumana. It is navigable as far as the village of San Antonia de Clarinas, six leagues from the sea. Its course extends about 30 leagues from S. to N.

UNAROTA, among the *Ancients*, a carriage with only one wheel.

UNAU, in *Zoology*, a name given by Buffon to the BRADYPUS *didactylus*; which see. See also SLOATH;

UNAWA, in *Geography*, a town of Hindoostan, in Guzerat; 12 miles S.E. of Puttan.

UNBALLAST, *To*, in *Sea Language*, is to discharge the ballast of a ship.

UNBENDING, generally implies the act of taking off the sails from their yards and stays; of casting loose the anchors from their cables, or of untying one rope from another.

UNBIAK, or SEMISOKOSCHNOI, in *Geography*, one of the Fox islands, in the North Pacific ocean, about 72 miles in circumference. N. lat. 53° 40′. E. long. 179° 14′.

UNBIT-

UNBITTING, in *Sea Language*, denotes the operation of removing the turns of a cable from off the bitts.

UNCARIA, in *Botany*, so named by Schreber, from *uncus*, a hook, alluding to the hooked prickles of the stem in one species. See NAUCLEA.

UNCASING, among *Hunters*, the cutting up or flaying of a fox.

UNCASTILLO, in *Geography*, a town of Spain, in Aragon, on the Riguel; 12 miles N. of Exea.

UNCATA, in *Botany*, a name given by some authors to the stramonium, or thorn-apple.

UNCEASESATH, in our *Old Writers*, an obsolete word, used where one killed a thief, and made oath that he did it as he was flying for the fact, and thereupon *parentibus ipsius occisi juret unceasesath*, *viz.* that his kindred would not revenge his death; or they swore that there should be no contention about it.

Du-Cange derives the word from the negative particle *un* and the Saxon *ceath*; which last signifies the same with *assithment* in the law of Scotland.

UNCERTAIN, in the *Manege*. We call a horse uncertain that is naturally restless and turbulent, and is confounded in the manege he is put to, so that he works with trouble and uncertainty.

UNCHÆ, in *Ancient Geography*, a town of Asia, in Assyria, about two stages from the road of the straits at the entrance into this province. Quintus Curtius.

UNCHASAIR, in *Geography*, a town of Hindoostan, in the subah of Delhi; 10 miles S.S.E of Secundara.

UNCIA, a term generally used for the twelfth part of a thing. In which sense it occurs in Latin writers, both for a weight called by us an *ounce*, and a measure called an *inch*. See OUNCE. See also MEASURE and WEIGHT.

UNCIA, in *Zoology*, a species of *Felis*; which see.

UNCIA *Terræ*, or *Agri*, is a phrase frequently met with in the ancient charters of the British kings; but what the quantity of ground was is a little obscure. All that we know for certain is, that it signified a large quantity, as much as twelve modii, which modius some conjecture to have been an hundred feet square.

UNCIÆ, in *Algebra*, are the numbers prefixed to the letter of the members of any power produced from a binomial, residual, or multinomial root: now usually called *co-efficients*.

Thus, in the fourth power of $a + b$, that is, $a\,a\,a\,a + 4\,a\,a\,a\,b + 6\,a\,a\,b\,b + 4\,a\,b\,b\,b + b\,b\,b\,b$, the unciæ are 4, 6, 4.

Sir Isaac Newton gives a rule for finding the unciæ of any power arising from a binomial root. Thus: let the index of the power be called m, then will the unciæ arise from such a continual multiplication as this, *viz.* $1 \times \frac{m-0}{1} \times \frac{m-1}{2} \times \frac{m-2}{3} \times \frac{m-3}{4} \times \frac{m-4}{5}$, &c. Thus, if the unciæ of the biquadrate or fourth power were required; the rule is, $1 \times \frac{4-0}{1} (=4) \times \frac{4-1}{2} (=6) \times \frac{4-2}{3} (=4) \times \frac{4-3}{4} (=1)$; which shews that the unciæ are 1, 4, 6, 4, 1.

Or thus: The terms of any powers are compounded of certain little factums, with numbers, called unciæ, prefixed; and the factums are found by making two geometrical progressions; the first of them beginning from the required power of the first part of the root, and ending in unity; and the second beginning with unity, and ending in the required power of the second part; thus, for a sixth power of $a + b$;

$$\begin{array}{ll} a^6\ a^5\ a^4\ a^3\ a^2\ a^1 & \text{first series.} \\ 1\ b\ b^2\ b^3\ b^4\ b^5\ b^6 & \text{second series.} \end{array}$$

And multiplying the terms of the same order in either series into one another; as $a^6 + a^5 b + a^4 b^2 + a^3 b^3 + a^2 b^4 + a b^5 + b^6$, out of which the sixth power of $a + b$ is compounded.

The unciæ, then, are found by writing the exponents of the powers of the second series, *i. e.* of b, under the exponents of the powers of the first series, *i. e.* of a; and taking the first figure of the upper series for the numerator, and the first of the lower for the denominator of a fraction, which is equal to the uncia of the second term, and so for the rest. Thus, for the sixth power, we have,

$$\begin{array}{cccccc} 6 & 5 & 4 & 3 & 2 & 1 \\ 1 & 2 & 3 & 4 & 5 & 6 \end{array}$$

Accordingly, $\frac{6}{1} = 6$ is the uncia of the second term of the sixth power; $\frac{6.\ 5.}{1.\ 2.} = \frac{30}{2} = 15$, the uncia of the third term; $\frac{6.\ 5.\ 4.}{1.\ 2.\ 3.} = \frac{120}{6} = 20$, the uncia of the fourth term; $\frac{6.\ 5.\ 4.\ 3.}{1.\ 2.\ 3.\ 4.} = \frac{6.\ 5.}{1.\ 2.} = \frac{30}{2} = 15$, the uncia of the fifth term; $\frac{6.\ 5.\ 4.\ 3.\ 2.}{1.\ 2.\ 3.\ 4.\ 5.} = \frac{6}{1} = 6$, the uncia of the sixth term; $\frac{6.\ 5.\ 4.\ 3.\ 2.\ 1.}{1.\ 2.\ 3.\ 4.\ 5.\ 6.} = 1$, the uncia of the last power. See BINOMIAL *Theorem*.

UNCIAL, UNCIALIS, an epithet which antiquaries give to certain large-sized letters, or characters, anciently used in inscriptions and epitaphs.

The word is formed from the Latin *uncia*, the twelfth part of any thing, and which, in geometrical measure, signified the twelfth part of a foot, *viz.* an inch; which was supposed to be the thickness of the stem of one of these letters.

UNCIFORME Os, in the carpus, is the fourth bone of the second row; it has its name from the Latin *uncus*, a *hook*, and is composed of a body, and a hooked, or unciform, apophysis. See *Carpus*, under EXTREMITIES.

UNCINARIA, in *Zoology*, a genus of the Vermes Intestina, the characters of which are, that the body is filiform and elastic, obsoletely nodulous forward; with angulated membranaceous lips; the tail of the female is aciculated, and that of the male armed with two cuspidated hooks inclosed in a pellucid bladder. There are two species, one lodging in the thick intestines of the badger, and the other in those of the fox.

UNCINIA, in *Botany*, from *uncus*, a hook, because of the barbed or hooked awn, on which the generic distinction is founded.—" Perf. Syn. v. 2. 534." Brown Prodr. Nov. Holl. v. 1. 241.—Class and order, *Monoecia Triandria*. Nat. Ord. *Calamariæ*, Linn. *Cyperoideæ*, Juss. *Cyperaceæ*, Brown.

Eff. Ch. Male, Glumes imbricated every way, single-flowered. Corolla none.

Female, in the lower part of the same spike, Glumes imbricated every way, single-flowered. Corolla of one leaf, capsular,

capsular, contracted at the mouth, scarcely divided, permanent. Awn inserted into the receptacle, beneath the germen, longer than the corolla, hooked. Nut inclosed in the enlarged corolla.

Mr. Brown observes, that this genus differs from *Carex* merely in the presence of the awn, which by no means originates from the base of each scale, as described by Willdenow, Sp. Pl. v. 4. 209, and by Persoon; but from the receptacle, within the corolla, termed by Mr. Brown perianth, on the outermost side. Hence, we would remark, a new difficulty occurs respecting the true denomination of the part here called by us corolla, which we have always taken for a tunic, *arillus*, but which cannot be such, if separated from the seed by the awn, a part belonging to the flower.

1. U. *compacta*. Br. n. 1. — "Spike oblong, dense, many-flowered. Lowest scale awned. Fruit densely imbricated, perfectly smooth. Stem smooth. Leaves flat, straight."—Found by Mr. Brown, in Van Diemen's island.

2. U. *riparia*. Br. n. 2.—"Spike thread-shaped, rather loose, of few flowers. Lowest scale like the rest. Fruit alternate, half-imbricated, lanceolate, ribbed, perfectly smooth. Angles of the stem rough. Leaves flat, flaccid."—From the same country.

3. U. *australis*. Br. under n. 2? (Carex uncinata; Linn. Suppl. 413. Willd. Sp. Pl. v. 4. 209. See CAREX, n. 12.)—Spike thread-shaped, dense, many-flowered. Lowest scale leafy-pointed. Fruit lanceolate, scarcely ribbed. Stem smooth. Leaves flat. Awn twice the length of the glume.—Native of New Zeeland. We presume this must be what Mr. Brown means by *U. australis*, though we can find no pubescence about the top of the *fruit*, which he indicates as the chief distinction between this species and the last, except its longer *spike*.

4. U. *phleoides*. (Carex phleoides; Cavan. Ic. v. 5. 40. t. 464. f. 1. C. hamata; Swartz Prodr. 18. Willd. Sp. Pl. v. 4. 209. C. uncinata *b*; Swartz Ind. Occ. 84. Schkuhr Car. 13. t. G. f. 30. See CAREX, n. 11, by mistake printed *hamata*.)—Spike thread-shaped, elongated, dense, many-flowered. Fruit oblong, with three fringed angles. Awn thrice the length of the glume.—Native of Jamaica, Chili, and the island of Mauritius.

5. U. *erinacea*. (Carex erinacea; Cavan. Ic. v. 5. 40. t. 464. f. 2. Willd. Sp. Pl. v. 4. 210. See CAREX, n. 13.)—Spike cylindrical, dense. Fruit roundish, triangular, smooth. Awn five times the length of the glume.—Native of Chili, and Brasil near Montevideo. The *spike* measures about an inch and a half, being only about one-third the length of the last, though full as thick as in that species.

6. U. *tenella*. Br. n. 3.—"Spike thread-shaped, of few flowers. Scales uniform, deciduous. Fruit somewhat imbricated, lanceolate, smooth. Stem slender, with smooth angles. Leaves flaccid, nearly bristle-shaped."—Gathered by Mr. Brown, in the island of Van Diemen.

UNCINUS, in *Surgery*, the name of a small hooked instrument, serving for many purposes.

UNCKEL, in *Geography*, a town of Germany, on the right bank of the Rhine; 2 miles N. of Lintz.

UNCORE, or UNQUES *Prist, still ready*, in *Law*, a plea for the defendant, being sued for a debt due on a bond at a day past, to save the forfeiture of his bond, &c. by affirming that he tendered the debt at the time and place, and that there was none to receive it; and that he is yet also ready to pay the same.

UNCTION, UNCTIO, the act of anointing, or rubbing with oil, or other fatty matter.

Mercurial unction, properly applied, brings on a salivation. The surgeons cure divers wounds, ulcers, &c. by repeated unctions, with oils, unguents, cerates, &c.

UNCTION, in *Matters of Religion*, is used for the character conferred on sacred things by anointing them with oil.

Anciently in the eastern countries, which abounded so much in oil and odoriferous spices, it was the custom to separate persons and things designed for extraordinary offices or uses, by anointing them with ointments composed of such ingredients; symbolizing thereby, both an effusion of the necessary gifts to qualify them for their office, and a diffusion of the good and grateful effects expected from them.

There were three sorts of persons to whom this unction, or consecration, especially belonged, kings, priests, and prophets; who, therefore, are all of them (says Barrow) styled in scripture the *Lord's anointed*.

The unction of kings is supposed to be a ceremony introduced very late among Christian princes: Onuphrius says, none of the emperors were ever anointed before Justinian, or Justin. The emperors of Germany took up the practice from those of the eastern empire. King Pepin of France was the first king who received the unction.

Unction, although we have no scripture warrant for it, is one of those rites that succeeded baptism in the ancient church. Of unction, or chrismation, Tertullian (De Baptism.) says, "as soon as we are baptized, we are anointed with the blessed unction,—an external unction is poured upon us, but it is spiritually profitable." And Cyprian also says (Epist. 70. § 3.), "he that is baptized must of necessity be anointed, that having received the chrism or unction, he may be the anointed of God, and have in him the grace of Christ." Under this chrismation was comprehended signation, or the signing of the baptized person with the sign of the cross, which the minister performed with this ointment or chrism. See Tertullian, de Resurrect. Carnis, and Cyprian, de Unct. Eccles. § 16. To signation succeeded imposition of hands, or that which is now termed *confirmation*; which see. The ceremony of unction was derived from the Jewish rites, and was employed in the instalment of the high priest, to denote his sacerdotal consecration to the service of God. The unction of Christ by God the father, in consequence of which he was called Christ, or anointed, was urged as a plea for this carnal and external unction by Tertullian, ubi supra.

In the Romish church, besides an unction at baptism, on the forehead, and at confirmation, on the head (see CHRISM,) they have an *extreme* unction, given to people in the pangs of death, on the parts where the five senses reside, being the parts by which the person is supposed to have sinned.

The first mention that is made of this ceremony is by pope Innocent I. Sacred oil, indeed, was held in great veneration so early as the fourth century, and esteemed as an universal remedy; for which purpose it was either prepared and dispensed by priests and monks, or was taken from the lamps which were kept burning before the relics of the martyrs. But in none of the lives of the saints before the ninth century is there any mention made of their receiving extreme unction, though their deaths are sometimes particularly related, and their receiving the eucharist is often mentioned. But from the seventh century to the twelfth, they began to use this anointing of the sick, and a peculiar office was made for it; but the prayer that was used in it plainly shews that it was with a view to their recovery, for which purpose it is still used in the Greek church. But because it failed so often, that the credit of this

this rite was in danger of ſuffering much in the eſteem of the world, they began, in the tenth century, to ſay that it did good to the ſoul, even when the body was no better for it; and then they applied it to the ſeveral parts of the body, after having originally applied it to the diſeaſed parts only. In this manner was the rite performed in the eleventh century. In the twelfth, the prayers that had been made before for the ſoul of the ſick perſon, though only as a part of the office (the pardon of ſin being ſuppoſed to be preparatory to their recovery) came to be conſidered as the moſt eſſential part of it. After this the ſchoolmen brought it into ſhape, and then it was decreed to be a ſacrament by pope Eugenius; and it was finally eſtabliſhed at the council of Trent. Burnet on the Articles, p. 268. See Extream *Unction*.

UNCTORES, among the Romans, ſervants whoſe employment it was to anoint their maſter when he bathed.

UNCTUARIUM, a room in the ancient baths, where people were anointed before they went away.

UNCUS, among the Romans, an inſtrument uſed in torturing criminals. It was a kind of club, bent and inclined to one ſide.

UNCUTH, *Unknown*, is uſed in the ancient Saxon laws, for him that comes to an inn, gueſt-wiſe, and lies there but one night. In which caſe, his hoſt was not bound to anſwer for any offence he committed, of which he was guiltleſs himſelf.

"Prima nocte poteſt dici uncuth; ſecunda vero, gueſt; tertia nocte hogenhine." Bracton, lib. iii. See Third *night awn hynd*.

UNDALUS, in *Ancient Geography*, a town, according to Strabo, of Gallia Narbonnenſis, at the place where the river Selgæ (Sorgue) diſcharges itſelf into the Rhône. Livy calls it Vindalium, which probably is the true name, and Undalus a corruption.

UNDE, Undee, or *Undy*, in *Heraldry*. See Waved.

Unde *nihil habet*, in *Law*, a writ of dower. See Dote *unde nihil habet*.

UNDEARCORE, in *Geography*, a town of Hindooſtan, in the circar of Ruttunpour; 40 miles S.W. of Ruttunpour.

UNDECAGON, is a regular polygon of eleven ſides.

UNDECIMVIR, a magiſtrate among the ancient Athenians, who had ten other colleagues, or aſſociates, joined with him in the ſame commiſſion.

The functions of the undecimviri at Athens were much the ſame as thoſe of the prevôts de marechauſſé in France. They took care of the apprehending of criminals; ſecured them in the hands of juſtice; and when they were condemned, took them again into cuſtody, that the ſentence might be executed on them.

They were choſen by the tribes, each tribe naming its own; and as the number of tribes, after Calliſthenes, was but ten, which made ten members, a ſcribe or notary was added, which made the number eleven.—Whence their name, οι ενδεκα, or *undecimviri*, as Cornelius Nepos calls them in the life of Phocion. In Julius Pollux they are denominated ιπαρχοι, and νομοφυλακες. See Nomophylaces.

UNDENAS, in *Geography*, a town of Sweden, in Weſt Gothland; 81 miles E.N.E. of Uddevalla.

UNDER *the Sea*, in the *Sea Language*. A ſhip is ſaid to be ſo, when ſhe lies ſtill, or waits for ſome other ſhips, with her helm laſhed, or tied up a-lee. See Lying *under the Sea*.

UNDER-CHAMBERLAINS, or *Deputy-Chamberlains of the Exchequer*, officers there, who cleave the tallies, and read the ſame; ſo that the clerk of the pell, and the comptrollers of it, may ſee that the entries are true. They alſo make ſearches for all records in the treaſury, and have the cuſtody of Domeſday-book.

UNDER-CURRENT. See *Under*-Currents.

UNDERDENGARDE, in *Geography*, a town of Hindooſtan, in Coimbetore; 40 miles W. of Ardenelli.

UNDER-DITCHING, in *Agriculture*, a term applied in ſome diſtricts, as that of the county of Eſſex, to ſuch ditches as are formed for the purpoſe of taking away the ſurface wetneſs of land. In ſome places it is called land-ditching by the farmers. It is ſaid to be one of the moſt beneficial and permanent modes of improving land that is not commonly known. It is much practiſed in different parts of the above county, and with perfect ſucceſs, there being no ſort of huſbandry from which the land derives greater advantage. So that it is not unuſual for the farmer to extend the practice over almoſt the whole of his land, in this diſtrict. Where this practice is intended, it is firſt to be conſidered, whether the ſoil be ſufficiently open and porous for receiving a benefit adequate to the expence of performing it, as in very ſtrong land this ſort of ditching is not found to anſwer. However, in caſes where the wetneſs can ſink in a ready manner to eighteen or twenty inches in the land, the farmer may ſafely draw a furrow from the higheſt to the loweſt part of the field, then dig out a ſpit of earth below, and again with a tool three inches wide, contrived for the purpoſe, work fourteen or fifteen inches deeper, and with the bent ſcraper, for this uſe, take out all the looſe earth at the bottom; thus making a narrow channel along the centre of the furrow, leaving ſufficient ſupport on each ſide to keep up the materials uſed in filling, and prevent the replaced earth from falling into the narrow opening left for taking off the wetneſs. This ſort of ditching is done at different diſtances and depths, as there may be a neceſſity for them, and as the nature of the ſoil through which the wetneſs has to paſs into them may be, making them ſo as to empty themſelves into deep ditches at the bottoms of the fields; or where the fields are large, forming one or more leading ditches ſufficiently large to receive the wetneſs from ſeveral of the ſmaller ones, which are ſo contrived as to fall into them. In order to make theſe ditches of the moſt permanent uſe, they ſhould be cut perfectly ſtraight, and the paſſage for the wetneſs be made of an equal depth throughout, otherwiſe it will be ſtopped in the loweſt parts, and occaſion the ſides to fall in and choak up the ditch. In caſe the ſoil be adapted to it, this ſort of work will laſt twenty years, but where there are ſquails, with ſand or drift gravel, the paſſages are liable to choak in a ſhort time. The ploughs, carts, waggons, and other carriages, go over theſe ditches without injuring them in the leaſt; and in park grounds, and old paſtures, it is not uncommon merely to turn the ſod over the water-channel, without uſing any other materials; and the ditches are ſeen to work, or *draw*, as it is termed, as well after running thirty years, as they did at firſt. The improved appearance and better ſtate of the land are particularly evident after this method of ditching has been had recourſe to, and ſufficiently prove its utility and importance in different caſes. The practice is more fully explained in the ſecond volume of the Eſſex Report on Agriculture. See this work, and Surface-*Drain*. See alſo Surface-*Draining*.

UNDER-DRAIN and Draining, terms ſometimes employed to ſignify that ſort of drain, or opening and draining, which is cut and made to ſome conſiderable depth in the earth or ſoil, and calculated to convey and carry off internal water and wetneſs, or that proceeding from ſprings, in contradiſtinction to that of ſurface-drain and draining. See

See Spring-*Drain* and Spring-*Draining*. See also Draining *of Land*.

UNDER-FURROW, a term uſed to ſignify any ſort of operation or thing that is done under the furrow-ſlice of the plough which is juſt turned down or over, ſuch, for inſtance, as the putting in certain kinds of grain, ſeeds, or other crops, in particular circumſtances and ſorts of ſoil or land, the turning in particular ſorts of manure, green crops and other things, and many other proceſſes of a ſimilar nature.

Under-furrow *Sowing*, a term applied to that mode of introducing the ſeed into the ground, which is performed by depoſiting it in the bottom of the preceding furrow of the plough, and turning the next furrow-ſlice upon it.

In all caſes of under-furrow ſowing, however, great care is to be taken that the ſeed be not depoſited to too great a depth in the ſoil, ſo as by excluding it from the action of the oxygene principle of the air, to prevent or retard its germination and early growth, and thereby incur the riſk of its rotting and being deſtroyed. The depth of three or four inches, as the nature of the land may be, is, for the moſt part, fully ſufficient for this ſort of ſowing. See the next article.

Under-furrow *Sowing-Plough*, that ſort of plough, tool, or machine, which is particularly contrived for this manner of putting ſeed into the ground. An implement of this kind was not long ago invented with ſeven ſhares, ſo ſet at ſuitable diſtances, as to correctly execute the work in that number of furrows at the ſame time. It is conſtructed with a roller ſomewhat on the ſame principle, and in the ſame manner, as the ſowing roller; which is ſuppoſed to be an admirable mode of communicating motion in ſuch ſorts of machinery. See Sowing-*Roller*.

A plough of this nature has ſtill more lately been invented and conſtructed, which is ſaid to be ſimple and convenient, and to anſwer well in practice, but of the particular nature of its conſtruction, or the manner of its operating in performing the work, we are not informed.

A tool of this ſort, which would execute the buſineſs with ſufficient accuracy, expedition, and exactneſs, would be a matter of great utility and importance to the farmer, and prevent much injury and inconvenience in different reſpects.

UNDERGROWTH, in *Rural Economy*, a term applied to any ſort of young wood of the ſmall or bruſh kind, which grows under any kind of trees, or tall plants of the wood ſort. It is a deſcription of wood which is conſtantly cut down, in what may be ſaid to be the ſeaſon or ſtage of youth, ſooner or later, as the nature of the ſort, and the purpoſe for which it is raiſed, may be. See Underwood.

UNDERHILL, in *Geography*, a town of America, in the ſtate of Vermont, and county of Chittenden, containing 490 inhabitants; 24 miles N.N.E. of Newhaven.

UNDER-LEAF Apple-tree, a ſort of apple-tree which is valuable, as producing good fruit for the purpoſe of cyder. It is ſaid to be an excellent bearer, and in which the inſide of the tree is moſtly full of fruit. Some, however, think that the cyder afforded by it, though pleaſant, is inclined to be rather thin and weak. A good tree of this ſort is aſſerted to often carry twenty ſeam of apples. It is common in the apple-grounds of Glouceſterſhire.

UNDERLETTING Land, in *Agriculture*, the practice of reletting lands or farms, or the letting of them again by the tenants. It is a matter of much importance to the public, and to the advancement of huſbandry, that tenants ſhould have the power of underletting or aſſigning the farms they may hold, in different circumſtances and ſituations. And it has been remarked, in a late periodical work on farming, that, by the law of England, leaſes are not only aſſignable, but the proprietor of the land or farm muſt, on the aſſignment of the leaſe, declare his election, whether he inclines to hold the original leſſee bound for his rent, or truſts to the aſſignee, as he cannot have both; and that, on the whole, a leaſe, whether granted for a long or a ſhort term of years, ſeems to be held there under as ample powers as the proprietor could have poſſeſſed the ground himſelf by, for the period it has to run. But that in Scotland, from the preſent interpretation of the laws, by the deciſions of the court of ſeſſion, a leaſe or tack of lands there does not imply a power either to aſſign, or even to underlet or ſubſet; although, in the latter caſe, both the principal leſſee and ſubtenant were always underſtood to be bound for the rent to the landlord.

It may be noticed, it is ſaid, that theſe leaſes or tacks, in general, are, by the commentaries of their lawyers, conſidered as unaſſignable, from their being ſuppoſed to imply an election or choice of the perſon of the tenant by the landlord; yet it is admitted, that a life-rent leaſe or tack is aſſignable, which ſurely, it is thought, implies more of ſuch election or choice than any other. That all leaſes or tacks, too, that are to ſubſiſt for a great length of time, are alſo aſſignable, as well as ſubſettable; but that, rather unfortunately, the length of indurance that is neceſſary for conferring this privilege has not been legally fixed. By a late deciſion, in one caſe, it was found, it is ſaid, that a power of ſubſetting was implied in a leaſe of thirty-eight years. With due ſubmiſſion to the opinions of others, however, there ſeems, it is contended, to be no ſolid ground for any diſtinction, in judging a leaſe or tack aſſignable or unaſſignable, as derived from the length of its duration merely. It is ſaid in addition likewiſe, that, by the feudal law, this right of election or choice was carried ſo far, that even an heir was not permitted to enjoy the leaſe or tack of his father, unleſs it was ſo expreſſed in the leaſe-deed. What an obſtacle was this to the improvement of the ſoil! And it is aſked, does not the excluſion of aſſignees, in leaſes or tacks, ſtill remain an obſtacle of the ſame nature? What an incentive, on the other hand, would it be to induſtry, if a tenant, who had ſucceſſively improved one farm, had it in his power to aſſign his leaſe or tack, and remove to another, to a new and wider field for exerciſing his talents! Nor does there ſeem, it is ſaid, to be any ſound reaſon why a tenant, who now-a-days generally buys his leaſe or tack, as the higheſt bidder, at a public or private ſale, ſhould not have it in his power to ſell it again, to avoid loſs, or obtain profit, to any perſon able to pay the rent, as freely as a proprietor of lands ſells his property, when he finds it does not ſuit his views. This plan, it is thought, would be much more reaſonable, than that the law ſhould force a tenant to remain in a farm he cannot manage, until he is utterly ruined; as is but too often the caſe. And that, moreover, if a tenant does become bankrupt, it is hardly to be expected that an adjudger, who enters to his farm from neceſſity, and is accountable as a factor, will do any thing for the improvement of it: for it is held as law, that a leaſe or tack, which bears no power to aſſign, may yet be adjudged by a creditor of the tenant. Expediency may, therefore, in every view, be ſtrongly urged in favour of a more unlimited power in aſſigning leaſes or tacks in that part of the country.

The notion of the right of election, or choice of the tenant by the landlord, ſeems, it is thought, to have ariſen from circumſtances of a temporary nature, which are now no longer of any conſequence: from the rudeneſs of the age,

age, landlords then relying more on the fidelity of their tenants and retainers than on the protection of the laws, from the municipal regulations of the country, which rendered proprietors of the land responsible for the conduct of those who resided upon their estates; and also from the nature of the *prestations* then exigible from tenants, which, consisting almost entirely of personal services, brought them nearer the state of menial servants than that of modern farmers. Hence it was, it is said, that a lease, during these periods, was considered as a contract *stricti juris*. If given to a woman, it fell by her subsequent marriage; if to a man, it became void by his death. It was alike incapable of voluntary, as of judicial transmission. But, for more than a century past, this contract having been treated by the legislature, and wisely enforced by the judges there, in conformity to the sense of the country, has, it is asserted, regained much of its original nature. It is no longer the personal services of the tenant, or his peculiar qualifications, but the rent in money which he can afford to pay, which a landlord has in view. Accordingly, the court of session there has found, that the principle of law, regarding leases or tacks not bearing to assignees, being unassignable without the consent of the heritor, does not apply to urban tenements, and made decisions in conformity to it. And that as to subtacks or leases, it has been observed, that there was not the same reason against sustaining them as against sustaining assignations; because, by a subset or underletting there, the principal tenant or tacksman is not changed. On that principle, the power of granting them seems to have been ever, until of late, recognised as implied in a lease, by the law of Scotland, as it was by that of the Roman. This power was, however, questioned in the years 1686 and 1687. The first case was that of a lease or tack of nineteen years let to a person, secluding his assignees. It was contended, that the exclusion of assignees implied the exclusion of subtenants, or underletting; but the court of session there decided that the lease or tack might be subset. And it adhered to the same judgment, in a similar case, decided in the following year.

It may be noticed, that this implied power in leases or tacks, of subsetting or underletting, appears to have been understood to be a settled principle of law there until lately; and that that material point of public policy was not altered by any act of the legislature, but by a decision of the above court. It was first considered on general grounds, it is said, in the case of a missive of a lease or tack, to endure nineteen years, which made no mention of assignees or subtenants, and was found by it neither capable of being assigned or subset. And there have since been several decisions to the same purpose; but that as none of them have probably yet been appealed, and received the judgment of the house of peers, until then it may be understood that the law is as interpreted in the above cases.

Upon the whole, it can hardly be doubted that it would be more conducive to the improvement of the country, and its agriculture, if all restrictions against assigning and subsetting or underletting were abolished and done away with, than that the free disposal of property of the farm kind should receive, by implication, additional fetters. The necessity and utility of this must indeed be evident in a great many different points of consideration. See Farm, Lease, and Tack.

UNDER-LOCKS, in *Sheep Husbandry*, the locks of soiled wool which hang under the bellies of the sheep, especially about their udders and tails. The operation of removing such locks is termed under-locking in most sheep districts. See Sheep.

UNDERMINING. See Sap.

UNDER-RUN, *To*, in *Sea Language*, is to pass under, or examine any part of a cable or other rope, in order to discover whether it is damaged or entangled. It is usual to under-run the cables in particular harbours, as well to cleanse them with brooms and brushes from any filth, ooze, shells, &c. collected in the stream, as to examine whether they have sustained any injury under the surface of the water; as from rocky ground, or by the friction against other cables or anchors.

Under-run *a Tackle*, *To*, is to separate the several parts of which it is composed, and range them in order, from one block to the other; so that the general effort may not be interrupted, when it is put in motion. Falconer.

UNDER-SAIL, denotes the state of a ship when she is loosened from her moorings, and under the government of her sails and rudder.

UNDER-SHERIFF, *Sub-vice-comes*. See Sheriff.

UNDER-SHOOT and Sprout, in *Agriculture* and *Gardening*, that sort of shoot or sprout which rises from the under-part of a tree or vegetable of any kind. The under-shoots of trees and shrubs are often liable to be weak, and to want vigour, unless they are kept well thinned in their branches, and, of course, to be injurious and unsightly in the growth of the plants. But in some field and culinary vegetables, under-sprouts frequently form a sweet, tender, and useful food. See Shoot and Sprout.

UNDER-SHRUB. See Suffrutex.

UNDER-SITTER, an inmate. See Inmates.

UNDERSTANDING, Intellectus, is defined, by the Peripatetics, to be a faculty of the reasonable soul, conversant about intelligible things, considered as intelligible. They also make it twofold; *viz.* *active* and *passive*.

Understanding, *Active*, *Intellectus Agens*, they hold that faculty of the soul, by which the species and images of intelligible things are framed, on occasion of the presence of phantasms or appearances thereof. For, maintaining the intellect to be immaterial, they hold it impossible it should be disposed to think by any disproportionate phantasms of mere body; and, therefore, that it is obliged to frame other proportionate species of itself; and hence its denomination *active*.

Understanding, *Passive*, *Intellectus Patiens*, is that which, receiving the species framed by the active understanding, breaks forth into actual knowledge.

The moderns set aside the Peripatetic notion of an active understanding. The Cartesians define the understanding to be that faculty, by which the mind, conversing with, and, as it were, intent on itself, evidently knows what is true in any thing not exceeding its capacity.

The Corpuscular philosophers define the understanding to be a faculty, expressive of things which strike on the external senses, either by their images, or their effects, and so enter the mind. Their great doctrine is, *Nihil esse in intellectu, quod non prius fuerit in sensu*; and to this doctrine our famous Mr. Locke, and most of the latest English philosophers, subscribe.

The Cartesians exclaim much against it; and between these and the Corpuscularians there is this farther difference, that the latter make the judgment to belong to the understanding; but the former to the will.

Hence, according to the most approved opinion of the Corpuscularians, the understanding has two offices, *viz.* *perception* and *judgment*; according to the Cartesians, it has only one, *viz.* *perception*.

Understanding is also used for the act, exercise, or exertion,

exertion, of this faculty; or the action by which the mind knows things, or represents them in idea to itself.

UNDERSTRATUM, in *Agriculture*, a term signifying much the same as subsoil and substratum. It is the bed or layer of some sort of material, upon which the surface or upper soil or mould rests, or is placed. It is of much use in many cases of land to have an open understratum. See Soil.

UNDERTAKERS were anciently such persons as were employed by the king's purveyors, and acted as their deputies.

At present, the name is chiefly used for *upholders*, or persons who furnish out funerals; and also for such as undertake any great work, as the draining of fens, &c. Stat. 43 Eliz.

UNDER-TREASURER *of England*, *Vice-thesaurarius Angliæ*, an officer mentioned in stat. 39 Eliz. c. 7. and whom several other statutes confound with treasurer of the Exchequer.

He chested up the king's treasure at the end of every term, and noted the content of money in each chest, and saw it carried to the king's treasury in the Tower, for the ease of the lord treasurer, &c.

In the vacancy of the lord treasurer's office, he also did every thing in the receipt, that the lord treasurer himself does. See Treasurer.

UNDERWALDEN, or Unterwalden, in *Geography*, a canton of Switzerland, bounded on the north by Lucern and Waldstatter lake, on the east by mountains which separate it from Uri, on the south by Bern, and on the west by Lucern. It measures about eight leagues each way, and is divided into two valleys, Upper and Lower, by a forest called "Kernwald," which crosses the canton from north to south. These valleys are called in German "Unterwald ob dem Wald," and "Unterwald nid dem Wald;" that is, "Underwald over the Forest," and "Underwald under the Forest." Each of them forms a separate regency. The canton itself is small, but abounds in fruit and cattle. The mountains are covered with rich pastures, and the fields in the fertile valleys, in one year, yield several advantages: for in spring time, when the snow is off the ground, they are full of cattle; afterwards, the cattle being driven up the Alps, the herbage shoots again in such a manner as often to be mowed twice in the summer; and in autumn, the cattle, on their return from the Alps, meet again with plenty of fodder in them, till the snow sets in a-new. All the lower parts of the country produce an exuberance of very fine fruits; and with wood this canton is so well provided, that without any detriment to it, several spots might be assorted and improved into meadow or arable land. Of wheat it has little or none, and grows no wine. The Underwalders are universally Roman Catholics, and have ever enjoyed the like liberties with the people of Uri and Schweitz. In conjunction also with them, in the year 1308, they shook off the Austrian yoke. Arnold de Melchtal, a native of this canton, was one of the four heroes who first reared the standard of Swiss liberty; and in 1315, they entered into a perpetual alliance with the said states. At the conclusion of the war with Charles the Bold, Friburgh and Soleure having contracted an alliance with Zuric, Bern, and Lucern, the treaty was considered by Uri, Schweitz, Underwalden, Zug, and Glarus, as a breach of the former union. After various disputes and fruitless conferences, the deputies of the eight confederate cantons assembled, in 1481, at Stantz, in order to compromise the differences. When the deputies failed to effect a reconciliation, and a civil war appeared to be inevitable, Nicholas de Flue, a celebrated saint and patriot, born at Saxelon in 1417, quitted the hermitage to which, in his 50th year, he had retired, and in his 64th year, after having travelled during the night, arrived at Stantz just at the moment when the deputies were departing. The conference was renewed by his persuasion, and all differences were adjusted. Among the confederate body, they are reckoned the sixth; but among the six landern or lesser cantons, the third. The government of this canton is purely democratical, the landesgemeind being the depositary of the whole supreme power, and in which all males above sixteen have a right of admittance. As the country, however, consists of two vales, viz. Oberwald and Underwald, each of them forming a separate republic, so they have both their own particular landesgemeind and officers; but in the general affairs of the thirteen cantons they form only one. Of all the people of Switzerland, those of Underwald are the most honoured and most loved by the other cantons; their courage and love of liberty being joined by a strict concord, and an amiable simplicity of manners. In the late contest with the French, the inhabitants of Schweitz and Underwalden manifested a noble spirit, and an ardent desire of independence; and at length submitted with great reluctance. (See Schweitz.) Sarne or *Sarnen* (which see) is the capital burgh of the Upper Vale, or Oberwalden; and here the land-rath, as supreme court of judicature, assembles, for the purpose of deciding civil and criminal processes. This tribunal is composed of fifty-eight judges, chosen by the people, and continued in office for life. Stantz or *Stans* (which see) is the capital of the Lower Vale, or Underwalden, and is the seat of civil and criminal judicature; and it is worthy of notice, that every male, of the age of thirty years, is permitted to give his vote for the acquittance or condemnation of a criminal. This town is situated in a beautiful plain of pasture, about two or three miles in breadth, at the foot of the Stantzberg, and at a little distance from the lake of Lucern. The town and environs, which are delightfully sprinkled with cottages, are extremely populous, containing perhaps not less than 5000 persons.

UNDERWICK, a town of Sweden, in Helsingland; 30 miles W.S.W. of Hudwickswall.

UNDERWOOD, in *Rural Economy* and *Planting*, a term applied to small coppice, or any sort of low wood that is not accounted timber. It is mostly used for that which rises and grows under some sort of wood of the tree kind, and which is capable of being used for a great variety of little purposes, such as hoops, faggots, and many others, as will be seen below.

In Sussex, where wood is well known to grow remarkably well, the mode of managing the underwoods is, according to the Corrected Report on Agriculture for that county, to cut them at from eleven or twelve to fifteen or sixteen years' growth; as, upon favourable well-growing soils, from eleven to thirteen; and upon poor grounds, on which wood rises more imperfectly, from fifteen to eighteen. But as the age of cutting materially depends upon the qualities of the soil, and the application of the crop or produce, no fixed rule can evidently be laid down, other than the above stated general one. The underwoods of some, as those of the earl of Egremont, are cut at from twelve to sixteen years of age, in cases where the growth consists of oak, beech, alder, and willow: the underwood is then, it is said, the most valuable part of the conversion, except in the vicinity of hop-plantations, where the poles afford a much better price; but in the cases where the underwoods abound with birch, ash, hazel, and willow, of which hoops are usually made, at from ten to twelve years of age. Newly planted

planted grounds are always earlier cut; the ſhoots are more rapid and ſtrong.

It is noticed as worthy of remark and deſerving of attention, that underwoods, at twelve or thirteen years' growth, are as valuable upon ſome ſoils, as they would be, if cut down or over at a later age, eſpecially if they are advantageouſly planted in the neighbourhood of hop-grounds; as poles of that age and ſize are equally as good, and anſwer all the purpoſes of larger: as when underwood has exceeded the ſize of poles, its utility, it is ſaid, is there not otherwiſe eſſentially ſerviceable than as it is valuable for fuel. The younger, therefore, it is cut there, if fit for the market, the more productive it will turn out, and the ſooner the ſucceeding crop will be ready for ſale; for when underwoods are left too long before they are cut, beſides growing ſlower, the intereſt of the money is loſt for which they might have been ſold. The under or ſmall wood upon the moſt growing ſoils, as the difference that exiſts is conſiderable in this reſpect, is worth from eight to ten or eleven pounds the acre; but that to gain ſuch a product, the land, it is obſerved, muſt be exceedingly kindly for the growth of wood.

The beech underwoods of the county of Oxford moſtly conſiſt of trees or plants growing on their own ſtems, produced by the falling of the beech maſt; as very little is there permitted to grow on the old ſtools, which are commonly grubbed up. They are occaſionally drawn out, but never felled all at one time, except in particular inſtances of converting the land into tillage, which is lately become more common. The beech underwood drawn in this manner is moſtly either ſold in long lengths, called poles, or, when cut ſhort in billet lengths, for fuel. It requires conſiderable judgment, it is ſaid, to thin theſe underwoods in ſuch a way that the preſent ſtock may not hang too much over the young ſeedlings; at the ſame time, too, in a ſouthern aſpect, an injury may take place, by expoſing the ſoil or ſurface of the land too much to the ſun: for it is to be obſerved, that the north ſide of a hill will produce a better growth of beech than the ſouth ſide; the very reverſe of which is the caſe in regard to corn. In beech underwoods alſo, the ſucceſſion of young trees is greatly injured by admitting ſheep or other cattle into them; and though it is ſuppoſed by ſome, that ſheep do no damage in winter, when the leaf is off, but find conſiderable feed from the graſs and other plants abounding in ſuch underwoods, yet it is the opinion of others, that the wool which is left hanging on the young ſtocks is prejudicial to their growth, allowing, what is doubtful, that the ſheep do not crop them. Some improvement might probably be produced by keeping better fences, eſpecially againſt commons, where a wide ditch is often an eſſential part of the mound; and alſo by tranſplanting the young beech from thoſe parts of an underwood where they are too thick, ſo as that they would be deſtroyed, by the ſtrongeſt overpowering the weakeſt, to thoſe places where they may not ſtand ſufficiently thick, there being moſtly ſpots of both theſe ſorts to be found in all underwoods of this kind.

In Cornwall and ſome other ſouthern counties, the underwoods are moſtly of the common oak, and are uſually cut at from twenty to thirty years' growth, ſelling at from twenty to ſixty pounds the acre, the chief profit depending upon the bark. Some of the wood is converted into poles, for farm and other purpoſes; but the greateſt part is commonly charred, for the uſe of the blowing-houſes, and domeſtic purpoſes; the bruſhwood being ſold for fuel. Such are the advantages of this ſort of wood for different uſes in theſe places, that inſtances of the grubbing up of underwoods are very rare. In the felling of underwoods, in theſe ſituations, a great advantage has lately been found, in more attention being paid to the reſervation of ſaplings as ſtandards, than was formerly the caſe. The land producing underwood of this kind, in theſe diſtricts, is found to be more valuable than that in the ſtate of tillage, in many caſes.

In ſome of the more northern counties, much advantage is derived, in different caſes, from underwoods of the aſh kind, when cut at about fourteen years' growth, for various uſes.

It may be noticed that underwoods, in many ſituations, are greatly neglected, and managed in a very indifferent manner; but they require a good deal of attention in different reſpects, to have them in good perfection; and it is neceſſary, in many caſes, to grub up the old decayed ſtubs at every time of felling the wood, when freſh plants will come forth of the different kinds, before the next felling, which will keep the underwood in a perfect and proper ſtate of cultivation and growth.

The proper ſoils for the growth of underwood muſt neceſſarily vary with the nature of the plants; but for the oak and aſh, thoſe of a rather ſtrong ſtiff quality are found the moſt ſuitable. In Suſſex, the former riſes with aſtoniſhing rapidity in a ſort of red clay. The cheſnut, hazel, and ſome others, require a more light and free ſoil; and the willow, one that inclines to moiſture. But they all allow of conſiderable variety in the qualities of the ſoils on which they grow.

Underwoods in many caſes riſe naturally from the ſtubs and ſeeds of the old wood, and they are formed and planted in different ways, according to circumſtances, and the nature of the plants. For raiſing cheſnut underwood, which is the beſt and moſt laſting wood for ſtakes, hop-poles, and ſome other uſes, Mr. Forſyth adviſes the following method as the moſt advantageous. To prepare the land well by ploughing or trenching, and ſummer-fallowing, planting the young trees in the quincunx order, in rows ſix feet apart, and at the diſtance of ſix feet from plant to plant in the rows. In forming large extents of ſuch underwoods, it is the moſt expeditious way to plant after the plough, treading the mould firmly about the roots of the plants. Baſins ſhould be formed round the plants on the ſurface, in order to mulch them, in caſe the firſt ſummer ſeaſon after putting them in be dry. It may ſave time, too, to put the plants in looſely at firſt, in order to keep up with the plough, returning afterwards to tread the earth about them, and form the baſins for mulching. When the trees are become fit for poles, every other one is to be cut down nearly cloſe to the ground, throughout the whole, conſtantly cutting them in a ſloping manner, and as near to an eye or bud as may be. Thoſe intended to ſtand ſhould be left in every other row, which will leave them twelve feet apart every way: if the ſoil be, however, rich and deep, they may be left twenty-four feet apart. As in many counties, particularly Hertfordſhire, the underwood is more valuable than the other; in that caſe it will be moſt judicious, it is ſaid, to leave but few ſtandards; in the meantime the underwood will amply repay the expence of planting and other things, as well as the rent of the ground, while at the ſame time a ſufficient produce of timber-trees is had upon the land. In the county of Kent, it is remarked, they commonly plant out cheſnuts and aſh for hop-poles at three years old, and cut them fourteen years afterwards, which makes in all ſeventeen years before they are fit to cut; and they bring from one guinea and a half to two guineas the hundred: but if they were raiſed from large ſtools, it is ſaid,

ſaid, properly cut and prepared, they would be fit for cutting in leſs than one-third of that time; and conſequently the value of the land be tripled.

In Suſſex, it is remarked, that in the newly planted underwoods of the firſt cuttings, which are made at ſeven or eight years' growth, the profit is little or nothing: that in the ſecond it is ſtill inconſiderable; ſo that for fourteen or ſixteen years the return from young planted underwoods is but trifling, which is not very encouraging to the planter of ſuch wood: the third is the moſt profitable cutting, as the underwood has now reached its ultimate perfection: the fourth often equals the third; but after this the underwood advances no more. The effect of the young ſtandard-trees is now viſibly apparent to the prejudice of the underwood, which in ſixty years, if the trees be left to ſtand ſo long, it is ſaid, is deſtroyed.

The application and uſes to which underwood is converted in the above, and ſome other diſtricts, are various; as poles for hop-grounds, bavins, ſpray-faggots for lime-kilns, cord-wood for coaling, and hoops for the uſe of the coopers, beſides affording large ſupplies of wood for fuel and other purpoſes of that kind. Aſh is ſuppoſed, of all the various ſpecies of underwood, with the exception perhaps of alder, to be the moſt profitable; the ſmalleſt pieces being of uſe in ſome ſhape or other, and ſuited to a greater number of purpoſes than moſt other ſorts. But the point of view in which this ſort of wood is conſidered as ſo particularly valuable, is the uſe to which the ſhiverers convert it in quartering it into middlings, long and ſhort hoops, as its value in theſe ways is perfectly well known. Birch is rapid in its growth, and pays well on poor moiſt ſoils; but on all ſoils, where the alder is in plenty, as it forms the beſt charcoal for the gunpowder-makers, it is the moſt valuable underwood, being converted to patten poles and powder-wood. Cutting of the former is paid two ſhillings for the hundred in the above county; they meaſure in common from three-fourths to a foot each, and ſell for five-pence the foot. The cutting and ſtripping of the powder-wood are moſtly three ſhillings and ſixpence the load, which is ſold for twenty-four ſhillings.

The value of underwoods, as in the caſe of moſt other products, has increaſed here, as well as in moſt other places, conſiderably in their price of late years. In ſome parts they have doubled their value in twenty years. Various new demands for them have been created; ſo that ſome think underwood lands are the moſt profitable of any whatever. See Woods.

Underwood, *Stealing of*. See Larceny.

UNDERWRITERS are perſons who ſubſcribe their names to policies of inſurance, and become anſwerable for the ſums annexed, in caſe of loſs or damage of the ſhip, goods, &c. thus inſured by them to the owner.

Serjeant Marſhall obſerves, that there are many reaſons why an agent or broker ought not to be an inſurer. He becomes too much intereſted to ſettle with fairneſs the rate of premium, the amount of partial loſſes, &c. And though he ſhould not, himſelf, create any unneceſſary delay or obſtacle to the payment of a loſs, he will not be over anxious to remove the doubts of others. Beſides, he ought not, by underwriting the policy, to deprive the parties of his unbiaſſed teſtimony, in caſe of diſpute. For though there may be no legal objection to his *competency*, as a witneſs for the other underwriters, it is impoſſible that his *credit* ſhould be altogether free from ſuſpicion. The principal, in ſhort, can never place any reliance in one who makes himſelf an adverſe party, and who is, at the ſame time, above all others, in a capacity to abuſe his confidence.

It has been determined in general, that an underwriter cannot be a witneſs in an action on a policy; but if the broker, who effects a policy, ſubſcribe it himſelf, after the other underwriters have ſubſcribed it, he may be a witneſs for the other underwriters, if they releaſe him from all contribution for coſts, though an action be depending againſt him, and he has joined in a bill of equity againſt the inſured, for a diſcovery. Marſhall on the Law of Inſurance.

UNDETERMINED, in *Mathematics*, is ſometimes uſed for indeterminate.

UNDIMIA, in *Surgery*, the name of a kind of œdematous tumour, the matter contained in which is glutinous and ropy, like the white of an egg.

UNDIVIDED, in *Botany*, applied to leaves, or other parts of a plant, means that they are not lobed, cloven, or branched, this term having no reference to the margin of a leaf, which, when deſtitute of all notches or indentations, is called entire, *integerrimus*; the leaf itſelf being either undivided or lobed, as it may happen. The earlier tranſlators of Linnæus, ſuch as Mr. Roſe, rendered *folia integra*, by *entire*, and *folia integerrima*, by *very entire*; which, though correct in language, is not the true meaning, the former being ſynonimous with *undivided*, and the latter regarding the margin only.

UNDRET, in *Geography*, a town of Baglana; 45 miles S. of Tolnani.

UNDULAGO, in *Natural Hiſtory*, a name given by Mr. Lhuyd to a ſpecies of fungites found foſſile, and uſually of a ſort of undulated figure. See Fungitæ.

UNDULATED Leaf, among *Botaniſts*. See Leaf.

UNDULATION, in *Acouſtics*, *Mechanics*, *Optics*, &c. is nearly ſynonimous with *Vibration*; which ſee.

Dr. Young, in the illuſtration and eſtabliſhment of his theory of light and colours, uſes the term undulation in preference to vibration; becauſe vibration is generally underſtood as implying a motion which is continued alternately backwards and forwards, by a combination of the momentum of the body with an accelerating force, and which is naturally more or leſs permanent; but an undulation is ſuppoſed to conſiſt in a vibratory motion, tranſmitted ſucceſſively through different parts of a medium, without any tendency in each particle to continue its motion, except in conſequence of the tranſmiſſion of ſucceeding undulations, from a diſtinct vibrating body; as, in the air, the vibrations of a chord produce the undulations conſtituting ſound.

Dr. Young commences the explanation of his theory with premiſing a number of hypotheſes, and with ſhewing how far they agree with the ſyſtem of Newton, and in what reſpects they differ from it. He aſſumes, 1ſt, with Newton, (ſee our article Æther,) that a luminiferous ether pervades the univerſe, which is in a high degree rare and elaſtic. 2dly. Undulations are excited in this ether, whenever a body becomes luminous. 3dly. The ſenſation of different colours depends on the different frequency of vibrations, excited by light in the retina. The three hypotheſes above recited, and which, according to Young, may be called eſſential, are literally parts of the more complicated ſyſtem of Newton. 4thly. All material bodies are to be conſidered, with reſpect to the phenomena of light, as conſiſting of particles ſo remote from each other, as to allow the ethereal medium to pervade them with perfect freedom, and either to retain it in a ſtate of greater denſity and of equal elaſticity, or to conſtitute, together with the medium, an aggregate, which may be conſidered as denſer, but not more elaſtic. Our author next proceeds to unfold and eſtabliſh his theory by a ſeries of propoſitions, which our limits will allow us merely to tranſcribe.

Prop.

PROP. I.

All impulses are propagated in a homogeneous elastic medium with an equable velocity. In different mediums, the velocity will vary in the subduplicate ratio of the force directly, and of the density inversely. From the phenomena of elastic bodies and of sounds it appears, that the undulations may cross each other without interruption.

PROP. II.

An undulation, conceived to originate from the vibration of a single particle, must expand through a homogeneous medium in a spherical form, but with different quantities of motion in different parts.

PROP. III.

A portion of a spherical undulation, admitted through an aperture into a quiescent medium, will proceed to be further propagated rectilinearly in concentric superficies, terminated laterally by weak and irregular portions of nearly diverging undulations. This proposition, though the principle of it is objected to by Newton, is, according to our author, perfectly consistent with analogy and experiment.

PROP. IV.

When an undulation arrives at a surface which is the limit of mediums of different densities, a partial reflection takes place, proportionate in force to the difference of the densities.

PROP. V.

When an undulation is transmitted through a surface terminating different mediums, it proceeds in such a direction, that the sines of the angles of incidence and refraction are in the constant ratio of the velocity of propagation in the two mediums. The demonstration of this proposition will prove the equality of the angles of reflection and incidence.

PROP. VI.

When an undulation falls on the surface of a rarer medium, so obliquely that it cannot be regularly refracted, it is totally reflected, at an angle equal to that of its incidence.

PROP. VII.

If equidistant undulations be supposed to pass through a medium, of which the parts are susceptible of permanent vibrations, somewhat slower than the undulations, their velocity will be somewhat lessened by their vibratory tendency; and in the same medium, the more, as the undulations are more frequent.

PROP. VIII.

When two undulations, from different origins, coincide either perfectly or very nearly in direction, their joint effect is a combination of the motions belonging to each.

PROP. IX.

Radiant light consists in undulations of the luminiferous ether. For the illustration and proof of these propositions, the corollaries deducible from them, as particularly applicable to the colours of striated surfaces, thin and thick plates, and those by inflection, and a reply to the objections that may be urged against the author's theory, we refer to Young's Philosophy, vol. ii. See also Phil. Trans. for 1800.

UNDULATION, in *Physics*, a kind of tremulous motion or vibration, observable in a liquid; by which it alternately rises and falls, like the waves of the sea; and hence it is that the term takes its rise, from *unda*, *wave*. See WAVE.

This undulatory motion, if the liquid be smooth, and at rest, is propagated in concentric circles, as most people have observed upon throwing a stone, or other matter, upon the surface of a stagnant water, or even upon touching the surface of the water lightly with the finger, or the like.

The cause of these circular undulations is, that, by touching the surface with the finger, there is produced a depression of the water in the place of contact. By this depression, the subjacent parts are moved successively out of their place, and the other adjacent parts thrust upwards, which, lying successively on the descending liquid, follow it; and thus the parts of the liquid are alternately raised and depressed, and that circularly.

When a stone is thrown into the liquid, the reciprocal vibrations are more conspicuous: here the water in the place of immersion rising higher, by means of the impulse or rebound, till it comes to fall again, gives an impulse to the adjoining liquid, by which means that is likewise raised about the place of the stone, as about a centre, and forms the first undulous circle; this falling again, gives another impulse to the fluid next to it farther from the centre, which rises likewise in a circle; and thus, successively, greater and greater circles are produced.

UNDULATION, in *Medicine*, the term used by some to express an uneasy sensation in the heart, of an undulatory motion, which may sometimes be perceived externally.

UNDULATION, or *Beat*, in *Music*, is used for that rattling or jarring of sounds, which is observed, chiefly, when discordant notes are sounded together. See BEATS.

The phenomenon is more fully described thus, by Dr. Smith. In tuning musical instruments, especially organs, it is a known thing, that while a consonance is imperfect, it is not smooth and uniform, as when perfect, but interrupted with very sensible undulations or beats; which, while the two sounds continue at the same pitch, succeed one another in equal times, and in longer and longer times, while either of the sounds approach gradually to a perfect consonance with the other, till at last the undulations vanish, and leave smooth, uniform consonance. Smith's Harmonics, p. 107. See HARMONICS.

This learned author observes farther, that quicker undulations are beats, and are remarkably disagreeable in a concert of strong, treble voices, when some of them are out of tune; or in a ring of bells ill tuned, the hearer being near the steeple; or in a full organ badly tuned. Nor can the best tuning wholly prevent that disagreeable battering of the ears with a constant rattling noise of beats, quite different from all musical sounds, and destructive of them, and chiefly caused by the compound stops called the cornet and sesquialter, and by all other loud stops of a high pitch, when mixed with the rest. But if we be content with compositions of unisons and octaves to the diapason, whatever be the quality of their sounds, the best manner of tuning will render the noise of their beats inoffensive, if not imperceptible.

The doctor has with great ingenuity deduced the theory of these undulations from his principles, and has applied his doctrine to the tuning of instruments; by which he has shewn, that a person of no ear at all for music may soon learn to tune an organ, according to any proposed temperament of the scale, and to any desired degree of exactness, far beyond what the nicest ear, unassisted by theory, can possibly attain to. This may be done by counting the number of undulations in a certain time, such as fifteen

feconds. See the treatife before cited, prop. xv. p. 215. and the Table, p. 244. plate 20.

From this ingenious theory the learned author has demonftrated feveral errors in what monfieur Sauveur has delivered concerning thefe undulations or beats. See Harmonics, Scholium 2. p. 115.

In the fame treatife we find fome curious obfervations relating to the analogy of audible and vifible undulations. See p. 128. 273.

UNDULATION is alfo ufed in *Surgery*, for a motion enfuing in the matter contained in an abfcefs, upon fqueezing it. A tumour is faid to be in a condition for opening, when one perceives the undulation.

UNDULATORY MOTION is applied to a motion in the air, by which its parts are agitated after the like manner as waves in the fea; as is fuppofed to be the cafe when the ftring of a mufical inftrument is ftruck.

This undulatory motion of the air is fuppofed the matter or caufe of *found;* which fee.

Inftead of the *undulatory*, fome authors choofe to call this a *vibratory* motion.

UNDULATUM FOLIUM, in *Botany*. See LEAF.

UNDULLEE, in *Geography*, a town of Bengal; 5 miles S. of Doefa.

UNDY, in *Heraldry*. See WAVED.

UNEDO, in *Botany*, the name of a fruit, fo called, according to Pliny, book 25. chap. 24, becaufe one only was to be eaten. He gives *Arbutus* as a fynonym. The meaning of the above name feems to be, that the fruit in queftion might, by its beauty, tempt any perfon to eat it once, but that its infipidity would prevent any further inclination to tafte it. We have, neverthelefs, found this fruit gratefully refrefhing and wholefome in our fatiguing botanical excurfions in the fouth of France, and have eaten it plentifully. (See ARBUTUS *Unedo.*) This tree, figured in Engl. Bot. t. 2377, is found about the lake of Killarney, in Ireland, in a naturalized, if not a wild, ftate. The *Comaron* of the Greeks, mentioned by Pliny, is not this, but *Arbutus Andrachne;* fee Prodr. Fl. Græc. v. 1. 274.

UNELLI, or VENELLI, in *Ancient Geography*, a people mentioned by Cæfar among other inhabitants of Armorica, and not belonging to Brittany. Ptolemy defcribed their capital under the name of Crociatonum, the pofition of which is that of Valognes. In the Notitia of the provinces of Gaul, Civitas Conftantia, from which the appellation of Cotentin is derived, was the capital of the canton occupied by the Unelli.

UNEQUAL, in *Botany*, applied to a leaf, means that the two halves, feparated by the mid-rib, are of evidently different dimenfions, and efpecially that their bafes are not parallel. Inftances occur in the Elm, (fee ULMUS,) as well as in the fine exotic genera of *Begonia* and *Eucalyptus*. The furface of a *leaf* or *ftem* is termed unequal, when it is rugged, not even or fmooth, without any reference to the pubefcence. An *unequal corolla* has fome fegments, or petals, alternately fmaller than the others, fo as not to interfere with the *regularity* of its figure. This may occur in fome fpecies of a genus only, nor does it neceffarily mark a generic difference. —*Stamens* are *unequal* in the claffes *Didynamia* and *Tetradynamia*, with refpect to their proportion only.

UNEQUAL *Courfes*. See MASONRY.

UNEQUAL *Hours*. See HOUR.

UNEVEN NUMBER. See NUMBER.

UNG, in *Geography*, a river of Hungary, which rifes in the Crapack mountains, and runs into the Latoreza, 7 miles N. of Zemplin.—Alfo, one of two fmall ftreams which form the river Laubach, in Carniola.

UNGELD, compounded of the negative *un*, and *gildan, to pay*, in our *Ancient Cuftoms*, a perfon out of the protection of the law; fo that if he were murdered, no *geld*, or fine, was to be paid in the way of compenfation by him that killed him. See GELD, and ÆSTIMATIO *capitis*.

Si Frithman, i. e. homo pacis, fugiat et repugnet, et fe nolit indicare; fi occidatur, jaceat ungeld, i. e. no pecuniary compenfation fhall be made for his death. Skinner.

Ungilda akere, mentioned in Brompton, has much the fame fignification; *viz.* where any man was killed, attempting any felony, he was to lie in the field unburied, and no pecuniary compenfation was to be made for his death.

UNGHA, in *Geography*, a town and caftle on the eaft coaft of Tunis, furrounded by moraffes, but without a harbour, or road; 76 miles S. of Cairoan.

UNGVAR, a town and fort of Hungary, on the Ung. This town was feized by the malecontents; but, in 1685, recovered by the Imperialifts, with count Tekeli's treafure and jewels; 22 miles N. of Munckacz.

UNGUENT, UNGUENTUM, *Ointment*, in *Surgery*, a topical remedy, or compofition, chiefly ufed in the dreffing of wounds and ulcers.

Unguents, liniments, and cerates, are external forms, applied on divers parts of the body, both to cure, and to eafe and relieve them. They only differ from each other in their confiftence; with regard to which, unguents hold the medium; being ftiffer than liniments, but fofter than cerates.

Oils are ordinarily the bafes of all three; to which are added wax, axungia, and feveral parts of plants, animals, and minerals; both on account of the virtues they furnifh, and to give a confiftence to the oils, and to keep them longer on the part, that they may have more time to act.

Many extravagant encomiums have been beftowed on the efficacy of different preparations of this kind in the cure of wounds, fores, &c. and yet it is unqueftionable, that the moft proper application to a green wound is dry lint. But though ointments do not heal wounds and fores, they ferve, however, to defend them from the external air, and to retain fuch fubftances as may be neceffary for drying, deterging, deftroying proud flefh, and fuch purpofes.

We fhall here enumerate and defcribe the principal *cerates*.

The *common cerate* of the Lond. Pharm. is formed by adding four fluid-ounces of olive oil to four ounces of yellow wax, and mixing them.

For the *calamine cerate* of the Lond. Ph. fee CERATUM *epuloticum*.

The *cerate of impure carbonate of zinc*, formerly cerate of calamine ftone, Edinb. Ph., is compounded of five parts of fimple cerate, and one part of prepared impure carbonate of zinc. Thefe cerates, long known in practice under the name of "Turner's cerate," are ufeful dreffings in excoriations and ulcers; and as they are in a certain degree deficcative, they are applied to burns after the inflammation is abated, and to the eye-lids in ophthalmia tarfi.

For *cerate of bliftering flies*, ceratum Lyttæ, or ceratum cantharidis, fee CERATUM. This cerate is intended to promote a purulent difcharge from a bliftered furface, and it generally anfwers this purpofe without much irritation. But in fome habits it occafions ftrangury, great pain of the part, fwellings of the lymphatics, and fuch a degree of general irritation, as to produce œdematous fwellings, and eryfipelas of the neighbouring parts. It is obferved, that cerates or ointments for keeping open iffues are beft fpread on lint; and that the dreffings fhould in all cafes be renewed once in twenty-four hours.

Cerate of fuperacetate of lead of the Lond Ph. is prepared of

of two drachms of superacetate of lead in powder, two ounces of white wax, and half a pint of olive oil, by melting the wax in seven fluid-ounces of the oil, then adding gradually the superacetate of lead, separately rubbed down with the remaining oil, and stirring with a wooden spatula, until they be thoroughly incorporated. This is an excellent cooling cerate for burns, excoriations, and other inflamed sores.

For the *compound cerate of lead*, see CERATUM *lithargyri acetati compositum*. This is a mode of applying lead in the form of ointment, long known under the name of "Goulard's cerate," and is used in the same cases as the former cerate. The name, says Mr. B. T. Thomson, is very improper; and ought to have been *ceratum plumbi acetatis*, as the virtue of the composition altogether depends on the acetate of lead.

For the *mercurial cerate*, see CERATUM *mercuriale*.

The *resin cerate* of the Lond. Ph. is formed by mixing a pound of yellow resin and the same quantity of yellow wax together by a slow fire, and then adding a pint of olive oil, and straining the cerate while it is hot through a linen cloth. See CERATUM *resinæ flavæ*.

Cerate of savine of Lond. Ph. is obtained by melting two pounds of prepared lard and half a pound of yellow wax together, and boiling a pound of the fresh leaves of savine, bruised, in the mixture, and then straining through a linen cloth.

The *simple cerate* of the Edinb. Ph. is prepared of six parts of olive oil, three parts of white wax, and one part of spermaceti.

For the *soap cerate*, see CERATUM *saponis*. The efficacy of this cerate depends on the acetate of lead, which is formed in the first stage of the process; the soap answering scarcely any other purpose than that of giving consistence and adhesiveness. It is occasionally used as a cooling dressing.

For *cerate of spermaceti*, see CERATUM *spermatis ceti*. This and the simple cerate are soft cooling dressings.

Liniments are, in general, more active remedies than cerates or ointments; and act as local stimulants, relieving deep-seated inflammations and pains. For an account of the liniments of the Lond. Ph., see LINIMENT. See also OXYMEL *æruginis*.

The *ammoniated oil*, commonly called volatile liniment of Edinb. Ph., is prepared by mixing two ounces of olive oil with two drachms of water of ammonia.

The *liniment of ammonia* of the Dub. Ph. is obtained by mixing two fluid-drachms of caustic water of ammonia with two fluid-ounces of olive oil.

The *liniment of lime-water*, or oleum lini cum calce, Edinb. is prepared by mixing equal parts of linseed-oil and lime-water.

Liniment of lime of Dub. Ph. is formed by mixing lime-water and olive oil, of each three fluid-ounces. These are solutions of earthy soap, resulting from the chemical union of the lime and oil; and being devoid of acrimony, they are beneficially applied to burns and scalds. As the soapy matter separates from the water when it is kept for some time, it is always best to prepare this mixture when it is wanted.

The *camphorated oil* of the Edinb. Ph. is obtained by mixing two ounces of olive oil and half an ounce of camphor, so as to dissolve the camphor.

The *camphorated oil* of the Dub. Ph. is had by rubbing together half an ounce of camphor with two fluid-ounces of olive oil. (See LINIMENTUM *camphoræ*.) These solutions of camphor in fixed oil are very useful embrocations to glandular swellings, sprains, bruises, and to joints affected with rheumatic pains. The late Mr. Ware recommended it with the addition of half an ounce of the solution of subcarbonate of potash, to be applied to the eye-lids night and morning, in incipient amaurosis. The compound liniment of camphor is an useful stimulant application to sprains, bruises, and rheumatic pains. It is also an excellent vehicle for introducing opium into the habit by means of friction. An embrocation composed of f℥iss of this liniment, and f℥ss of tincture, warmed and rubbed over the surface of the abdomen, very quickly allays the pains of flatulent colic.

The *liniment of soap*, or tincture of soap of the Edinb. Ph., is prepared by digesting four ounces of soap sliced in two pounds of alcohol for three days, then adding two ounces of camphor, and half an ounce of volatile oil of rosemary, frequently shaking the mixture.

The *anodyne liniment*, or tincture of soap and opium, is made in the same manner, and of the same ingredients as the other tincture of soap, only adding, at the beginning of the process, an ounce of opium.

The principal unguents, or ointments, are enumerated in the sequel of this article. Pomatums are also ranked in the number of unguents. See POMATUM.

In the Edinburgh Pharmacopeia we have the following general rule for the preparation of unguents, applicable also to cerates: let the fatty matters and the resin be melted by a gentle heat, and then constantly stirred, sprinkling in the dry ingredients, if there be any, reduced to very fine powder, until the mixture, by cooling, becomes firm.

Unguentum acidi nitrosi, ointment of nitrous acid, Edinb. Ph., is obtained by mixing six drachms of nitrous acid gradually with one pound of melted hog's-lard, and beating the mixture assiduously as it cools. The Dub. College directs a pound of olive oil to be melted in a glass vessel, and an ounce by weight of nitrous acid to be added to it; then to expose them to a medium heat in a water-bath for a quarter of an hour; then to remove them from the bath, and to stir them constantly with a glass rod until they become firm. This ointment is said to have been invented by Alyon, who found it useful in syphilitic and herpetic ulcers. It has been occasionally used in this country for the same purposes; but it is less effectual than the ointment of nitrate of mercury.

U. album. See *U. oxidi plumbi albi*, infra.

U. ex ærugine. See VERDEGREASE.

The *ointment of subacetate of copper*, formerly ointment of verdigris, Edinb. is compounded of fifteen parts of resinous ointment, and one part of subacetate of copper. The *U. æruginis*, or ointment of verdigris of Dub. Ph., is formed by making one pound of ointment of white wax and half an ounce of prepared verdigris into an ointment. These ointments are escharotic and detergent; they are occasionally used as dressings to foul, flabby ulcers, and as an application to scrophulous ulcerations of the tarsi. In the undiluted state they can scarcely be used, unless to act as a caustic for taking down fungous flesh.

U. arcæi. See ELEMI and LINIMENTUM *arcæi*.

U. basilicum viride, a form of medicine prescribed in the late London Pharmacopeia, and ordered to be made thus: Take of yellow basilicon, eight ounces; oil of olives, three ounces; verdigris, in fine powder, one ounce; mix the whole into an ointment.

U. basilicum flavum, or yellow basilicon ointment, may be made by melting yellow wax, white resin, and frankincense, of each a quarter of a pound, over a gentle fire; and then adding of hog's-lard prepared, one pound; strain the ointment while warm. This is employed for cleansing and healing

ing wounds and ulcers. See BASILICON, CERATUM *Resinæ*, and *U. resinæ*, &c.

U. calaminare, or *epuloticum*, commonly called *Turner's cerate*. See *Calamine cerate*, supra, and CERATUM *epuloticum*.

U. ceræ flavæ, ointment of yellow wax of Dub. Ph., consists of a pound of purified yellow wax, and four pounds of prepared hog's-lard, formed into an ointment.

U. ceræ albæ, ointment of white wax of Dub. Ph., is prepared in the same manner as the former, with the substitution of white for yellow wax. These are useful dressings to benign ulcers and excoriations.

U. cetacei, or spermaceti ointment of the Lond. Ph., is prepared by mixing together six drachms of spermaceti and two drachms of white wax, over a slow fire, and stirring them continually till they be cold. The *U. spermatis ceti* of the Dub. Ph. is composed of half a pound of white wax, a pound of spermaceti, and three pounds of prepared lard, mixed into an ointment. These ointments form the ordinary dressings for healing blistered surfaces and excoriations.

U. citrinum is a mercurial ointment. See *U. nitratis hydrargyri fortius*, infra.

U. dialthææ. See DIALTHÆA.

U. elemi compositum, compound ointment of elemi of the Lond. Ph., is composed of a pound of elemi, ten ounces of common turpentine, two pounds of prepared suet, and two fluid-ounces of olive oil. The elemi is melted with the suet; then removed from the fire, and mixed immediately with the turpentine and the oil; and then the mixture is strained through a linen cloth. The *U. elemi* of the Dub. Ph. consists of a pound of elemi resin, half a pound of white wax, and four pounds of prepared hog's-lard: these are formed into an ointment, which is to be strained through a sieve while it is hot. These ointments are stimulant and digestive: they are used to keep open issues and setons; and as a dressing to ulcers which do not admit of the application of the adhesive straps.

U. emolliens, or emollient ointment, may be made by taking of palm oil, two pounds; of olive oil, a pint and a half; of yellow wax, half a pound; and of Venice turpentine, a quarter of a pound; melting the wax in the oils over a gentle fire, then mixing in the turpentine, and straining the ointment. This supplies the place of althæa ointment, and may be used for anointing inflamed parts, &c.

U. epispasticum. See *U. vesicatorium*, infra.

U. hydrargyri fortius, or strong mercurial ointment of the Lond. Ph., is prepared by first rubbing two pounds of purified mercury with an ounce of prepared suet, and a small quantity of twenty-three ounces of prepared lard, until the globules disappear, and then adding the remainder of the fat and mixing. Two drachms of this ointment contain one drachm of mercury.

U. hydrargyri, or vulgarly, *U. cæruleum*, Edinb., mercurial ointment, is compounded of one part of mercury, one part of mutton suet, and three parts of hog's-lard; and it is formed by rubbing the mercury diligently in a mortar with a little of the hog's-lard until the globules disappear, then adding the remainder of the lard. One drachm of this ointment contains twelve grains of mercury. It may also be made with double or triple the quantity of mercury. The Dublin College directs equal parts of purified mercury and prepared hog's-lard to be rubbed together in a marble or iron mortar, until the globules disappear. One drachm of this ointment contains thirty grains of mercury.

U. hydrargyri mitius of the Lond. and Dub. Ph., milder mercurial ointment, is prepared by taking of the stronger mercurial ointment, a pound; and prepared lard, two pounds; and mixing them. One drachm of this ointment contains ten grains of mercury; but prepared according to the Dub. Ph., with two parts of lard to one of mercury, one drachm contains a scruple of mercury. The preparation of the stronger mercurial ointments requires much labour, care, and patience.

When newly prepared, mercurial ointment has a light grey or blueish colour, owing to its containing some unoxidized metal, which separates in globules when it is liquefied by a gentle heat: when kept for some time, the colour is much deepened, and less metallic mercury subsides, owing to the more complete oxidizement of the metal. It is probable, therefore, that long kept mercurial ointment contains, besides the oxyd, a sebate of mercury.

The strong mercurial ointment rubbed upon the skin is the ordinary mode of introducing a large quantity of oxyd of mercury into the system. About ʒj is rubbed upon the inside of the thighs, or any other part of the body where the cuticle is thin, every night and morning until the system is affected. The oxyd contained in the ointment is absorbed during the friction, and carried into the habit; where it produces the same effects as arise from taking the remedy by the mouth, without the unpleasant affection of the bowels that very commonly follows the introduction of preparations of mercury into the stomach. In order, however, to produce the full effect of the friction, it must be continued until every particle of the ointment disappears; and the operation should be performed by the patient himself. The stronger mercurial ointment is used in this form as an antisyphilitic, as a deobstruent in hepatic affections, and to excite the absorbents in hydrocephalus. The weaker ointment is used only as a topical dressing in venereal sores. During a course of mercurials the patient should be kept in a moderately warm and dry, but airy chamber; and his diet should be chiefly weak broths, milk, and gruel.

The following table, extracted from Thomson's Dispensatory, exhibits the quantity of mercury contained in each of the different ointments ordered by the British colleges.

One drachm of the Lond.	stronger oint.	contains of merc.	30 grs.
	weaker oint.	———	10
of the Edin.	common oint.	———	12
of the Dub.	stronger oint.	———	30
	weaker oint.	———	20

U. oxidi hydrargyri cinerei, or ointment of grey oxyd of mercury, Edinb. is prepared by mixing one part of grey oxyd of mercury with three parts of hog's-lard.

U. hydrargyri nitratis, or ointment of nitrate of mercury of the Lond. Ph., is composed of an ounce of purified mercury, two fluid-ounces of nitric acid, six ounces of prepared lard, and four fluid-ounces of olive oil; and is prepared by first dissolving the mercury in the acid, then mixing the solution, while it is hot, with the lard and oil melted together.

U. nitratis hydrargyri fortius, vulgò *U. citrinum* of Edinb. Ph., is obtained by dissolving one part of purified mercury in two parts of nitrous acid; then beating up the solution strongly with the lard and oil previously melted together, and nearly cold, in a glass mortar, so as to form an ointment.

U. supernitratis hydrargyri of Dub. Ph. is prepared by dissolving an ounce of purified mercury in two ounces by weight of nitrous acid; then mixing the solution with the oil and lard previously melted together, and forming an ointment in the same manner as the ointment of nitrous acid.

U. nitratis hydrargyri mitius, or milder ointment of nitrate of mercury of Edinb. Ph., is made in the same manner as the stronger ointment, with a triple proportion of oil and lard.

 This

This ointment it ſtimulant and detergent. When moderately diluted with lard, it is a local remedy of great efficacy in herpetic eruptions, tinea capitis, and other cutaneous eruptions. The weaker ointment may almoſt be regarded as a ſpecific in pſorophthalmia, in the purulent ophthalmia of infants producing ectropium, and in ulcerations of the tarſi. It is applied by taking a little on the finger, liquefying it by the fire or the flame of a candle, and applying it along the inner part of the eye-lids.

U. hydrargyri nitrico-oxidi is obtained by melting together two ounces of white wax and ſix ounces of prepared lard, then adding to the mixture an ounce of the nitric oxyd of mercury in very fine powder, and mixing.

U. oxidi hydrargyri rubri, ointment of red oxyd of mercury of Edinb. Ph., is compounded of one part of red oxyd of mercury by nitric acid, and eight parts of hog's-lard.

U. ſubnitratis hydrargyri conſiſts of half a pound of white wax and half an ounce of ſubnitrate of mercury, which are formed into an ointment. Theſe are excellent ſtimulant ointments, well adapted for giving energy to indolent foul ulcers. They are alſo very beneficial in inflammation of the conjunctiva, with a thickening of the inner membrane of the palpebræ: and to ſpecks of the cornea. They ſhould be applied in the ſame manner as the ointment of nitrate of mercury.

U. hydrargyri præcipitati albi of Lond. Ph. is formed by adding a drachm of white precipitate of mercury to an ounce and a half of prepared lard, previouſly melted by a gentle heat, and mixing.

U. ſubmuriatis hydrargyri ammoniati of Dub. Ph. is obtained by forming one pound of ointment of white wax, and an ounce and half of ammoniated ſubmuriate of mercury, into an ointment. Theſe ointments are ſtimulant and detergent. They are recommended by ſome German authors as a remedy for the itch, which may be ſafely uſed on infants: but they have not been employed in this country.

U. e japanica terra. See JAPAN *Earth*.

U. linariæ. See ANTIRRHINUM.

U. mercuriale, or mercurial ointment. See *U. hydrargyri*, ſupra.

U. infuſi meloes veſicatorii, ointment of infuſion of bliſtering flies of Edinb. Ph., is prepared of bliſtering flies, reſin, yellow wax, of each one part; Venice turpentine, hog's-lard, of each two parts; and boiling water, four parts; by macerating the flies in the water for a night, and ſtraining the liquor, ſtrongly expreſſing it; then adding the liquor to the fat, and boiling until the water be evaporated; afterwards adding the wax and the reſin, and when theſe are melted, removing the mixture from the fire and adding the Venice turpentine.

This ointment is ſufficiently mild, but does not always keep open a bliſtered ſurface, ſo that it does not anſwer the purpoſe for which it is deſigned. The acrimony of the flies is nearly deſtroyed by the heat employed for the evaporation of the water.

U. nardinum. See NARDINUM *unguentum*.

U. nutritum is the name of an ointment of lead, made by grinding two ounces of litharge, and adding alternately, and by little and little, two ounces of vinegar, and ſix of oil. This unguent, though now expunged from our Diſpenſatories, is an excellent application in many caſes. It ſhould not be long kept, but made freſh as wanted. Lewis. See *U. ſaturninum*.

U. oculi, or eye-ointment. See *U. oxidi zinci impuri*, &c. infra.

U. oxidi plumbi albi, vulgò, *U. album*, ointment of white oxyd of lead of Edinb. Ph., conſiſts of five parts of ſimple ointment, and one part of white oxyd of lead.

U. ceruſſæ, ſive *ſubacetatis plumbi*, ointment of ceruſſa, or ſubacetate of lead of Dub. Ph., is compounded by forming a pound of ointment of white wax and two ounces of ceruſſa, reduced to a very fine powder, into an ointment. Theſe are cooling, deſiccative ointments, chiefly employed as dreſſings for burns.

U. oxidi zinci impuri, olim, *U. tutiæ*, Edinb., ointment of impure oxyd of zinc, formerly ointment of tutty, is compounded of five parts of ſimple liniment, and one part of prepared impure oxyd of zinc.

U. tutiæ, ointment of tutty of Dub. Ph., is prepared by forming ten ounces of ointment of white wax, and two ounces of prepared tutty, into an ointment. Theſe ointments were formerly much uſed in ophthalmia tarſi, but they are now ſeldom employed.

U. picis aridæ, pitch ointment of the Lond. Ph., is prepared by melting together pitch, yellow wax, and yellow reſin, of each nine ounces, and a pint of olive oil; and ſtraining the mixture through a linen cloth.

U. picis liquidæ, tar ointment of the Lond. Ph., is obtained by melting together tar and prepared ſuet, of each a pound, and ſtraining the mixture through a linen cloth.

U. picis, tar ointment of the Edinb. Ph., is compounded of five parts of tar, and two parts of yellow wax.

U. picis liquidæ, tar ointment of Dub. Ph. conſiſts of tar and mutton ſuet, of each half a pound, which are melted together, and then the mixture is ſtrained through a ſieve. The pitch and tar ointments are applicable to the ſame purpoſes; being uſed with advantage as detergents in ſcabby foul eruptions and tinea capitis.

U. piperis nigri, ointment of black pepper, is obtained by forming a pound of prepared hog's-lard and four ounces of black pepper in powder, into an ointment.

U. populeum. See POPULEUM.

U. pulveris meloes veſicatorii, olim, *U. epiſpaſticum fortius*, ointment of the powder of bliſtering flies, formerly ſtrong iſſue ointment, conſiſts of ſeven parts of reſinous ointment, and one part of powdered bliſtering flies.

U. cantharidis, ointment of bliſtering flies of Dub. Ph., is compounded of half a pound of ointment of yellow wax, and one ounce of bliſtering flies in powder, formed into an ointment. Theſe ointments anſwer the purpoſe of promoting a purulent diſcharge from bliſtered ſurfaces, when the irritation excited by them, which is ſometimes intolerable, can be endured. The flies ſhould be very finely pulverized, and very intimately mixed with the ointment.

U. reſinæ albæ, ointment of white reſin of Dub. Ph., is compoſed of a pound of yellow wax, two pounds of white reſin, and four pounds of prepared hog's-lard, which are made into an ointment, and this is to be ſtrained, while it is hot, through a ſieve.

U. reſinoſum, reſinous ointment of Edinb. Ph., is compounded of eight parts of hog's-lard, five parts of reſin, and two parts of yellow wax. (See CERATUM *reſinæ*.) Theſe ointments are ſtimulant, digeſtive, and cleanſing; and therefore form an excellent dreſſing for foul and indolent ulcers. See BASILICON.

U. ſabinæ, ſavine ointment of Dub. Ph., is obtained by taking freſh leaves of ſavine freed from the ſtalks and bruiſed, half a pound; prepared hog's-lard, two pounds; yellow wax, half a pound; boiling the leaves with the lard until they become criſp, then ſtraining with expreſſion, and laſtly adding the wax, and melting them together. (See CERATUM *ſabinæ*.) This ointment is very difficult of preparation. The freſh leaves are preferable to thoſe that are dry,

dry, because by drying their acrimony is impaired. When good, the colour of the ointment is a beautiful deep green, and its odour is that of the fresh bruised herb. It should be kept in closely covered pots, as it will soon lose its virtue by exposure to the air. Savine ointment, which is said by Mr. Thomson to have been first described by Mr. Crowther in his "Observations on White Swelling," serves for keeping up a purulent discharge from a blistered surface; and this it does as effectually and with much less irritation than the ointment of blistering flies.

U. sambuci, elder ointment of Lond. Ph., is formed by boiling two pounds of elder flowers in two pounds of prepared lard, until they become crisp, then straining the ointment through a linen cloth. The Dublin College directs three pounds of fresh elder flowers, four pounds of prepared hog's-lard, and two pounds of mutton suet, in the manner prescribed for the savine ointment.

These ointments are simply emollient, and possess no advantages superior to those of the simple ointment.

U. saturninum. See *Compound cerate of lead*, supra.

U. simplex, simple ointment of Edin. Ph., is formed of five parts of olive oil and two parts of white wax. This is an useful emollient ointment for softening the skin.

U. simplex is also a name given to the composition commonly called *pomatum*; which see.

U. subacetitis cupri, olim, *U. æruginis* of the Edinb. Ph., is formed of fifteen parts of resinous ointment, and one part of subacetate of copper. See VERDEGREASE and LINIMENT.

U. sulphuris, sulphur ointment of the Lond. Ph., is obtained by mixing three ounces of sublimed sulphur, with half a pound of prepared lard. The Edinb. Ph. directs to take of hog's-lard four parts, and one part of sublimed sulphur; and to add to each pound of the ointment, of volatile oil of lemon or volatile oil of lavender, half a drachm. The Dub. College orders four pounds of prepared hog's-lard, and a pound of sublimed sulphur, to be formed into an ointment.

These ointments are specific in itch. They should be rubbed on the body every night until the disease be cured; but not more than one-fourth of the body should be rubbed with it at a time.

U. sulphuris compositum, compound ointment of sulphur of the Lond. Ph., is a composition of sublimed sulphur, half a pound; white hellebore root in powder, two ounces; nitrate of potass, a drachm; soft soap, half a pound; and prepared lard, a pound and a half; which ingredients are to be mixed. This ointment is employed like the simple one, and in the same cases; it is supposed to derive additional efficacy from the white hellebore; but it often excites too much irritation.

U. tripharmacum, is prepared by boiling and stirring over a gentle fire four ounces of the common plaster, with one of vinegar, and two of oil, where a thick unguent is required; or four of oil, for a softer liniment.

U. veratri, ointment of white hellebore of Lond. Ph., is obtained by mixing two ounces of white hellebore root powdered, eight ounces of prepared lard, and twenty minims of oil of lemon.

U. hellebori albi, ointment of white hellebore of Dub. Ph., is compounded of a pound of prepared lard, and three ounces of white hellebore root in powder, which are made into an ointment.

These ointments are sometimes used for the cure of psora, when there is an objection to the smell of the sulphur; but as remedies, they are less certain.

U. vesicatorium, blistering ointment. See the appropriate articles, supra.

U. viride, the green ointment, a form of medicine prescribed in the late Lond. Ph., and ordered to be made by melting ten ounces of yellow wax in three pounds of the *oleum viride*, or green oil of the same Pharmacopeia.

U. zinci, zinc ointment of the Lond. Ph., is formed by mixing an ounce of oxyd of zinc, with six ounces of prepared lard. See ZINC. Thomson's Dispensatory.

UNGUICULI, in *Botany*, is used for the ends of the petals of roses, or other flowers, where they adhere to the plant.

UNGUIN, a name given by the people of Guinea to a plant, of which they are very fond, on account of its medicinal virtues: they boil it in water, and give the decoction in large draughts for pains in the back. The leaves of this plant grow alternately on pedicles of an inch long, and have the exact shape and size of those of the common bay-tree; but they have neither its taste nor smell, nor any thing approaching to either. Phil. Transf. N° 232.

UNGUIN, or *Ungar*, in *Geography*, a small island near the W. coast of Alashka, in the North Pacific ocean; about 20 miles long, rising in the interior into lofty mountains, but near the sea more level, and covered with brushwood, producing no vegetable food, except berries, and a root from which the Russians make the liquor called quass. The island abounds with deer. The settlement consists of one Russian and about thirty Indian families, which latter occupied huts constructed of mud, in the form of bee-hives, with a hole at the top instead of a door. They have no fire-places, but warm themselves by means of lamps made out of flat hollow stones, with rush wicks, which they placed under their frocks. This island is separated from the main land by a strait nearly ten miles wide at high water.

UNGUIS, a Latin term, signifying a nail of the hand or foot.

UNGUIS, in *Botany*, the claw, is the elongated base of a petal, conspicuous in the Pink, *Dianthus*, and in the Wall-flower and Stock, *Cheiranthus*, being distinguished by its taper form, and pale colour, from the border, *lamina*, which it supports. The claws of petals are, for the most part, inclosed in the perianth of the flower, though not invariably.

UNGUIS *Cati*, Cat's-claw, the name of a species of *Mimosa*, Linn. Sp. Pl. 1499, alluding to its sharp hooked thorns.

UNGUIS *Ossa*, in *Anatomy*, a small bone on each side of the head, situated in the inner corner of the eye. See CRANIUM.

UNGUIS, in *Surgery*, an abscess of the cornea, or of the anterior chamber of the eye, shaped like a nail.

UNGUIS, in *Natural History*, a name given by authors to a genus of shells, more usually called *solen*.

UNGUIS *Odoratus*, in the *Materia Medica*, a thin, flat, testaceous substance, of an oval or oblong figure, rounded at both ends, and marked on the surface with three or four concentric circles, or oval lines. Its colour is a dusky brown, with some mixture of the orange, sometimes of a purplish tinge. Its usual size is that of a full grown nail of a man's thumb; and its thickness rather less than that of the nail. It is tough, flexile, and elastic; and has no peculiar smell or taste.

The want of smell might seem to argue this to be a different substance from the *unguis odoratus* of the ancients, but the truth is, that their's owed all its sweet flavour to its being brought over among aromatic drugs.

There were two kinds of it, the largest of which they had from the Red sea, and the other from Babylon; and both were the opercula of two species of murex shells.

Dioscorides tells us, that this *unguis* was the operculum

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or poma of the ſhell, which ſtopped the mouth at pleaſure, and from under which the creature thruſt out its tongue to feed; and he adds, that the ſhell-fiſh to which it belonged was taken in the marſhes of India, when the waters were dried away; and that the Indian ſpikenard growing in great abundance in theſe marſhes, the creature became ſweet-ſcented in every part, by feeding on it. However, he concludes with telling us, that there were only two kinds brought into Greece in his time, the one from the Red ſea, the other from Babylon.

The truth is, that ſpikenard grows neither in the Red ſea, nor any where about Babylon, but only in India, beyond the Ganges, or about its banks. The ſpikenard alſo does not grow in the water, but only in marſhy places, and therefore can never be in the way of feeding ſhell-fiſh. Avicenna, perceiving the abſurdity and contradiction of Dioſcorides's account, ſays that the ſhell-fiſh was found in an iſland in the Indies, on which iſland the ſpikenard alſo grew in great abundance. But this account ſuppoſes that the ſhell-fiſh, to which the unguis odoratus belongs, may be found on dry land; whereas it is certain, that no ſhell-fiſh, living in the water, can ſubſiſt without ſome means of cloſing up its cavity, ſo as to keep out the water at pleaſure; this is done in the bivalve kinds, by cloſing the two valves; but in the ſtromboide ones, by drawing down this operculum, which is the unguis odoratus, to the mouth of the ſhell. A land-ſhell, therefore, can have no occaſion for ſuch a part as the poma or operculum, and no ſuch drug as the unguis odoratus can be found about it. But it is to be obſerved, that Avicenna did not know that the unguis odoratus was a covering or operculum of the mouth of a ſhell, but thought that it was only a fragment cut or broken indeterminately from any part of the ſhell. This therefore might appear no abſurdity to him; and the thin and flat ungues he ſaw might appear fragments artificially cut from ſome of the thin-ſhelled kind of land-ſnails. See Blatta *Byzantina*.

UNGULA, in *Geometry*, is the ſection of a cylinder, cut off by a plane paſſing obliquely through the plane of the baſe, and part of the cylindric ſurface.

Or, more generally, an ungula, or hoof, is a part cut off a ſolid by a plane oblique to the baſe.—To find the curve ſurface of the ungula D E A G D of a cylinder (*Plate* XV. *Geometry*, *fig.* 19.) put $b =$ the height A D, $v =$ the verſed ſine of A E, $d =$ the diameter A B, $a =$ the arc E A G of the baſe, $s =$ the right ſine F G, and $c =$ the coſine of the half arc; then $\frac{ds - ac}{v} \times b$ is the convex ſurface: *i. e.* from the product of the diameter and ſine, ſubtract the product of the arc and coſine, and multiply the difference by the height, and divide by the verſed ſine.

Note 1.—When F is the centre of the baſe, then $v = s = \frac{1}{2}d$, and $c = 0$; in which caſe the theorem becomes db, *viz.* the product of the diameter and height equal to the curve ſurface.

Note 2.—When A F exceeds $\frac{1}{2}$ A B, then ac muſt be added.

For the demonſtration of this theorem, draw H I, I K parallel to F A and A D reſpectively, and join the points H, K; ſince it is evident that the ſurface is generated by the motion of I K along the arc A I G, K I × the fluxion of I A will be the fluxion of the ſurface. Therefore put $z =$ A I, $x =$ its ſine I L, and $y =$ its coſine; then H I $= y - c$; and, by ſimilar triangles, F A : A D :: H I : I K $= \frac{b}{v} \times (y - c)$; and hence the fluxion of the ſurface, or $\dot{z} \times$ I K, is $\frac{b}{v} \times (y\dot{z} - c\dot{z}) = \frac{b}{v} \times (\frac{1}{2}d\dot{x} - c\dot{z})$: the fluent of which is $= \frac{b}{v} \times (\frac{1}{2}dx - cz) =$ (when A I = A G) $\frac{b}{v} \times (\frac{1}{2}ds - \frac{1}{2}ac)$; the double of which is $\frac{b}{v} \times (ds - ac) =$ the whole convex ſurface D E A G D

Cor. 1.—If F be the centre; then $v = s = \frac{1}{2}d$, and $c = 0$; and then the theorem becomes barely $db = 4$ times the triangle F D A.

Cor. 2.—When A F exceeds $\frac{1}{2}d$, c is negative, and then $-ac$ becomes $+ac$.

Cor. 3.—If F coincide with B; then $s = 0$, and $c = -\frac{1}{2}v$; and the theorem becomes $\frac{1}{2}ab =$ the ſurface of the half cylinder.

Example 1.—Let the diameter A B (d) be 100, the height A D (b) 140, and the verſed ſine A F (v) 10. Then $\frac{1}{2}d - v = 50 - 10 = 40 = c$; and $\sqrt{\frac{1}{4}dd - cc} = \sqrt{2500 - 1600} = \sqrt{900} = 30 = s$. But $\frac{s}{\frac{1}{2}d} = \frac{30}{50} = \frac{3}{5} = .6$ is the ſine reduced to the radius 1, to which, in a table of ſines, belong 36° 52.268′ = 36.87113 degrees. Then by the rule given under Arc *of a Circle*, the length of the arc a will be .01745329 × 36.87113 × 100 = 64.352252. Whence $\frac{ds - ac}{v} \times b = (3000 - 2574.09008) \times 14 = 425.90992 \times 14 = 5962.73888 =$ the convex ſurface required.

Ex. 2.—If the diameter and height be 100 and 140, as before, and the ſection be made through the centre of the baſe, or $v = \frac{1}{2}d = 50$; what is the convex ſurface?

Here, by note 1, $db = 100 \times 140 = 14000 =$ the convex ſurface required.

Ex. 3.—Suppoſing d and b ſtill the ſame, and $v = 90$; to find the convex ſurface.

Here $\frac{1}{2}d - v = 50 - 90 = -40 = c$, $s = 30$, the ſame as before, but it is here the ſine of the ſupplemental arc, which therefore is 180 − 36.87113 = 143.12887 degrees. Hence .01745329 × 143.12887 × 100 = 249.807013 = the arc a. Or, the arc may be ſooner found by only ſubtracting the arc in the firſt example, *viz.* 64.352252, from 314.159265, the whole circumference.

Then, by note 2, $\frac{ds + ac}{v}b = \frac{14}{9}(3000 + 9992.28052) = \frac{14}{9} \times 12992.28052 = 20210.21414$, the convex ſurface required.

To find the Solidity of the Hoof of a Cylinder.—From $\frac{2}{3}$ of the cube of the right ſine, ſubtract the product of the baſe and coſine of half the arc of the baſe; then multiply the difference by the height, and divide by the verſed ſine, the quotient will be the ſolidity required. That is, putting, as before, $b =$ the height A D, $v =$ the verſed ſine A F, $s =$ the right ſine F G, $c =$ the coſine $= \frac{1}{2}$ A B − A F, $b =$ the baſe or area of the ſeg. G A E G; then $\frac{\frac{2}{3}s^3 - bc}{v} \times b =$ the ſolidity.

Note 1.—If F be the centre, that is, if the baſe be equal to the ſemicircle, then $v = s$, and $c = 0$; and therefore $\frac{2}{3}bss = \frac{1}{6}ddb$ is the ſolidity in that caſe.

Note

Note 2.—If v exceed $\frac{1}{2}d$, that is, if the base exceed the semicircle, then c is negative, and bc must be added.

This theorem may be demonstrated in the following manner. The fluxion of the solid is = the Δ HIK drawn into the fluxion of LI, which fluxion will, therefore, be $\dot{x} \times \frac{h}{2v} \times HI^2$ (using the same characters as in the demonstration of the last problem) $= \frac{h\dot{x}}{2v} \times (y-c)^2 = \frac{h\dot{x}}{2v} \times (yy - 2cy + cc) = \frac{h\dot{x}}{2v} \times (\frac{1}{4}dd - xx - 2cy + cc) = \frac{h\dot{x}}{2v} \times (\frac{1}{4}dd - xx - dc + 2c \times AL + cc) = \frac{h\dot{x}}{2v} \times (ss - xx - 2c \times FL)$; whose fluent, $\frac{hx}{2v} \times (ss - \frac{1}{3}xx) - \frac{hc}{v} \times$ area FAIH, when I coincides with G, is $\frac{h}{2v} \times (\frac{2}{3}s^3 - bc)$, the double of which is $\frac{h}{v} \times (\frac{2}{3}s^3 - bc) =$ the content of the solid DEAGD required.

Cor. 1.—If F fall in the centre of the base, then $c = 0$, and $s = v = \frac{1}{2}d$, and the rule will be $\frac{1}{6}ddh$.

Cor. 2.—If AF exceed FB, c will be negative, and then $-bc$ will become $+bc$.

Cor. 3.—If F fall in B, $s = 0$, and $c = -\frac{1}{2}v$; and then the theorem becomes $\frac{1}{2}bh =$ half the cylinder.

Ex. 1.—If the diameter AB be 50, the height AD 120, and the versed sine AF 10; what is the solidity of the hoof?

Or, supposing a cylindric vessel ABCD, containing a fluid, to be placed in such a position that the surface of the fluid, disposing itself parallel to the horizon, may cut the base in GE, leaving 40 inches of the diameter dry, and the side of the cylinder in D, 120 inches distant from the base; to find how many ale gallons are in it, the diameter of the base being 50 inches.

Here $h = 120$, $d = 50$, and $v = 10$. Then $\frac{1}{2}d - v = 25 - 10 = 15 = c$, and $\sqrt{\frac{1}{4}dd - cc} = \sqrt{25^2 - 15^2} = \sqrt{40 \times 10} = 20 = s$.

And, to find the base by the table of segments, $\frac{v}{d} = \frac{10}{50} = .2$; this being found in the column of versed sines, opposite to it is the area .1118238: hence $50 \times 50 \times .1118238 = 279.5595 = b$ is the segment or base.

Then $\frac{\frac{2}{3}s^3 - bc}{v}h = 12 \times (\frac{2}{3} \times 8000 - 15 \times 279.5595) = 12 \times (5333\frac{1}{3} - 4193.3925) = 12 \times 1139.9408 = 13679.2896 =$ the solidity in inches; which, divided by 282, the inches in a gallon, give 48.50939 ale gallons for the content.

Ex. 2.—Suppose the cylinder so placed, that the surface of the liquor may bisect the base, and rise up the side to the same distance of 120 inches from the base: to find the content.

Here, by note 1, we have $\frac{1}{6}ddh = 50 \times 50 \times 20 =$ 50000 solid inches = 177.3049645 gallons, for the content in this case.

Ex. 3.—Suppose, now, the same vessel so placed, as that the surface of the liquor may leave only 10 inches of the diameter dry, still rising to the same distance of 120 inches along the side; to find the content.

Here the part of the cylinder's base left dry, is equal to the base in the first example, *viz.* 279.5595, which, therefore, taken from $50 \times 50 \times .78539816 = 1963.4954$, the whole circle, leaves $1683.9359 = b$, the base of the ungula in this example.

Now $v = 40$, $c = -15$, and $s = 20$.

Whence $\frac{\frac{2}{3}s^3 - bc}{v}h = (\frac{2}{3} \times 8000 + 25259.0385)\frac{120}{40} = 30592.3718 \times 3 = 91777.1154$ solid inches = 325.45076 gallons, the content in this case.

For the method of finding the solidity of the ungulæ or hoofs of other solids, we must refer to Hutton's Mensuration, part iii. § 1.

UNGULA, in *Natural History*, the claw, or hoof, of a quadruped.

UNGULA *Alcis*, the elk's claw. See ELK.

UNGULA, a technical name formerly applied to an abscess of the cornea, when the disease was fancied to resemble a hoof in its shape.

UNGULA, or *Hamus*, among *Surgeons*, a sort of hooked instrument, with which to extract a dead fœtus out of the womb.

UNGULUS, in *Antiquity*, a remarkable kind of bracelet.

UNHACA, in *Geography*, a small island in the Indian sea, at the entrance of the bay of Lorenzo Marques. N. lat. 26° 5′.

UNHALTER, in the *Manege*. A horse is said to unhalter himself that turns off his halter.

UNHOST, or AUNHOST, in *Geography*, a town of Bohemia, in the circle of Schlan; 8 miles S. of Schlan. N. lat. 50° 6′. E. long. 14° 15′.

UNIA, a small island in the Adriatic, W. of Osero. N. lat. 44° 52′. E. long. 14° 26′.

UNIAK, or UNIMAK. See OONEMAK.

UNIARA, a town of Hindoostan, in the circar of Rantampour; 18 miles S. of Rantampour.

UNICORN, in *Astronomy*. See MONOCEROS.

UNICORN, in *Geography*, a post-town of Pennsylvania, in Lancaster county; 124 miles from Washington.

UNICORN, in *Natural History*, an animal famous among the Greek authors, under the name of *μονοκερως*; and among the Latins, under that of *unicorn*.

Both these names it takes from its distinguishing characteristic, the having one horn only. See RHINOCEROS.

The first author who wrote of the unicorn, was one Ctesius, whom Aristotle mentions as a very suspicious author. Ælian speaks of it in very doubtful terms. The other writers on the subject are Philostratus and Solinus; Æneas Sylvius, who is pope Pius II; Marcus Paulus, Aleosius, Gesner, Garcias ab Orta, And. Marinus, &c. Of these, some say it resembles a horse, others an ass, others a goat, by its beard; others an elephant, others a rhinoceros, others a greyhound, &c.

Munster and Thevet will have it an amphibious animal, and its horn to be moveable at pleasure. Others make all its strength to consist in its horn; and add, that when pursued by the hunters, it precipitates itself from the tops of the highest rocks, and pitches upon its horn; which sustains the whole effort of its fall, so that it receives no damage thereby. In reality, the several authors do all give different accounts of the figure and colour, both of the animal and of its horn, and all its parts. And hence many among the moderns have supposed it to be a merely fabulous animal.

The legend adds, that it is wonderfully fond of chaste persons; and therefore, in order to take it, a virgin is placed in

in its way; whom when the unicorn spies, he lies down by her, and lays his head on her lap, and soon falls asleep; upon which the virgin makes a signal, the hunters come in, and take the beast; which could never be caught any other way, because it would either cast itself headlong from the rock, or die. For an account of the animal to which the appellation of the unicorn has been applied, see RHINOCEROS.

What ordinarily passes among us for unicorn's horn, and is shewn for such in the collection of curiosities, and used for such by several physicians, we are assured by Pereyra, in his account of Greenland, &c. is the tooth of a large fish of the whale kind, called by the islanders *narwal;* frequent enough in the icy sea. The tooth or horn, turned, channelled, and terminating in a point, as it is, springs out of the middle of the fore-part of the upper jaw, where it has a root a foot long, as thick as the horn itself: it is the only tooth the animal has in the upper jaw, and serves it as a weapon of defence, with which it dares to attack the largest whale. There is a fine horn of this kind preserved in the repository of St. Denis at Paris, given by And. Thevet, and pretended to have been a present to him from the king of Monomotapa, who carried him to hunt the unicorn; which is frequent in that country: this horn some have suspected to be an elephant's tooth, carved in that manner. At Strasburgh there is another between seven and eight feet long. In the repository at Venice there is a good number; all different from each other.

The ancients held the unicorn's horn to be a counter-poison; and that the animal used to dip it in the water, to purify and sweeten it, ere it would drink: it is added, that for the same reason other beasts wait to see this creature drink before them. Thence, as also from the rarity of the thing, people have taken occasion to attribute divers medicinal virtues to it.

But Amb. Paré has proved it a mere piece of charletanery, and all the virtues attributed to it to be false; and yet the price it has borne is almost incredible. Andrea Racci, a physician of Florence, affirms the pound of sixteen ounces to have been at one time sold, in the apothecaries' shops, for fifteen hundred and thirty-six crowns, when the same weight of gold was only worth one hundred and forty-eight crowns. See RHINOCEROS.

The unicorn is one of the supporters of the arms of England. This beast is represented, by heralds, passant, and sometimes rampant. When in this last action, as in the English arms, it is properly said to be *saillant*. Argent, an unicorn sejant sable, armed and unguled, or, borne by the name of *Harding*.

UNICORN, *Sea*, the name of a fish of the whale kind, called also *narhual*, or *narwal*, remarkable for having a horn growing out at its nose, in the manner of the supposed unicorn's horn, as described by many too credulous authors. It is the only species of monodon in the Linnæan system.

This fish feeds on flesh, or other fish, and is not only found in the main sea, but sometimes gets up into large rivers. In the year 1736 there was a large one caught in the river Oste, near its discharging itself into the Elbe, in the duchy of Bremen; this place is four German miles from the sea. The skin of this fish was spotted with dark-brown spots upon a white ground; the epidermis was transparent; and under it was another skin very thin and spotted; but the true skin was brown, and near an inch in thickness. On the top of the head there is only a semi-lunar hole, as in the porpoises; this hole opens into the two channels, which run through the skull to the palate, and are called the ductus hydragogi. The people who examined this creature were not able to find any aperture in the body for the discharge of the excrements; whence it has been generally believed, that the creature voids them through this passage in the head.

Authors have differed in the name of the process issuing from the head; some calling it a horn, others a tooth; some are of opinion that it serves to break the ice for air; but others pretend that it is an offensive weapon, with which it wounds the common whale, and other large fish; and that when it has plunged it up to the head in the whale's body, it sucks the juices of that animal.

The fish was near twenty feet long, and about four feet in diameter. The horn stood on the fore-part of the head, just above the mouth, and was six feet long, white like ivory, and curiously wreathed or twisted. The body was smooth and slippery, like that of an eel; the head, in proportion to the body, was small, not exceeding sixteen inches in length, and the same in diameter; the eyes not larger than a sixpence. It had, on each side of the neck, two black fins, one above another at a small distance; these were two feet long, of the breadth of a hand, and about half an inch in thickness. See the account of this fish by Dr. Steigertahl, and Dr. Hampe, in Phil. Trans. N° 447. p. 157, and p. 149. or Abr. vol. ix. p. 71, &c.

This unicorn's horn has been so common in the Danish and neighbouring seas, that there was a magnificent throne built only of them in that kingdom; the horns are from ten to fifteen feet in length, and are all white, and furrowed with a spiral line.

Unicorn's horn has the same medicinal virtues with hart's horn and ivory; but at present is only kept as an ornament in druggists' shops.

UNICORN, *Sea*, is also a name given to two sorts of small fish caught in the American seas, and known among authors under the name of *Monoceros piscis*.

UNICORNU *Fossile*, *Fossile Unicorn's Horn*, the name of a substance much used in medicine in some parts of the world, but which seems to have been very little understood by many who have written of it. Dr. Hill, from the examination of the several varieties of shapes it is found in, and trying it by the several tests which fix the criterions of fossils, has determined it to be no other than a terrene crustaceous spar, not very different from the osteocolla, and other bodies of that genus, which he has called the *cibdeloplacia;* and has distinguished this peculiar species by the name *cibdeloplacium albido-subcinereum, friabile, superficie lævi*, or the whitish-grey friable crustaceous spar, with a smooth surface.

It differs principally from the osteocolla in its softness, and the smoothness of its surface; but from its having, like many other of the crustaceous terrene spars, the property of encrusting, and sometimes even permeating the pores of bodies, and in a manner petrifying them, it has obtained the names of the things it thus lodges itself in and about, which being usually bone, and some of them bones of an extraordinary size and figure, have been taken for the bones and horns of unicorns; and the name and nature of the body itself wholly lost and neglected, and that of the horn, with that of its imaginary animal, only preserved.

They are, however, now sensible in Germany, that it is not the horn, but this substance, which is lodged about it, which is the medicine; for they never use the fossile bones which are petrified in the common way, but only such as are impregnated with this sparry substance; and even use all substances whatever, which are impregnated with this, whether bones or wood, under the same name, calling the natural

natural tubular pieces of it, which are very common, and alſo the pieces of branches of trees impregnated with it, by the common name of unicorn's horn, while they allow plain bones, petrified in the common way, no ſuch name. So that the word is now become a mere technical term, and ſignifies either this ſpar in its pure ſtate, or any ſubſtance whatever which is impregnated with it.

It is a lax and ſpongy terrene ſpar, and is naturally of a regular form, in ſome degree like that of the oſteocolla, being always found, where it has concreted pure, and not been in the way of any extraneous ſubſtance, an oblong and moderately thick, cylindric, tubular body, frequently narrower at one end than the other, and approaching to a conic form. Uſually its hollow is empty, but ſometimes it is found filled up with a ſubſtance of the ſame nature with itſelf, only compoſed of a larger proportion of earth with leſs ſpar, and therefore more crumbly and ſoft. Theſe are found of various ſizes, from an inch to three feet long. The larger ſpecimens are moſt frequent; and it is very probable, that the ignorance of the firſt ages, which brought it into uſe in medicine, might take theſe natural concretions for unicorns' horns.

It is found in other parts of the world beſides Germany, and is in great eſteem in many places as a ſudorific and aſtringent; and is given in fevers, attended with diarrhœas, with great ſucceſs. Hill.

Dr. Ebrens, in his Natural Hiſtory of Hartz Foreſt, in Germany, gives a particular account of this foſſile. He ſays that it is dug up of different ſhapes; ſometimes like a ſtraight horn, ſkull, jaw-bone, ſhoulder-blade, back-bone, rib, tooth, thigh-bones, or other bones of men and beaſts; and ſometimes like an unſhaped lump or maſs of ſtone, having no reſemblance to bone. Conrigius, and Otto Guerick, have maintained that this foſſile is petrified bone; others, as Sennertus, Schræder, Bauſchius, &c. not being able to comprehend how bones of ſuch ſize and in ſuch quantities ſhould be collected together, and diſſatisfied with the account given by naturaliſts of the manner of their petrifaction, reckon it among the minerals. Some think, with Labavius, that it is a bituminous earth; others ſay that it is a kind of agate; but Dr. Ebrens apprehends, that it is formed of a clayey or fattiſh earth, called *marga* or marle, common in that country, hardened by petrifying water, and aſſuming different ſhapes and ſizes, according to the ſituation in which this earth lies under ground. It is commonly of a light grey, black, or yellowiſh colour, and ſeldom perfectly white; ſometimes it is as hard as a ſtone, and ſometimes ſoft as clay, and hardens by being expoſed to the air. It has commonly neither ſmell nor taſte; though in ſome caſes it has been found with a ſcent like that of quinces, which Dr. Ebrens aſcribes to a bituminous ſubſtance mixed with the petrifying water. The whiteſt and melloweſt is reckoned the beſt for medical purpoſes. It operates, he ſays, like the terra ſigillata, abſorbing, aſtringing, and promoting perſpiration; and is one of the ingredients of the bezoardic powder, deſcribed by Ludovici in his "Pharmacopœia Moderno ſæculo applicanda," and produces a very good effect, unleſs a ſymptomatic coſtiveneſs forbids the uſe of it. Externally it ſerves in puſtulary eruptions and eroſions about the pudendum and fundament in children, and in eye-waters. Hoffman adviſes people to try the foſſile unicorn firſt upon a dog, before it is uſed in medicine; becauſe he thinks it is ſometimes of a poiſonous nature, but this is never obſerved in any foſſile of this kind found in or near Hartz Foreſt.

UNICZOW, or Mahrish Neustadt, in *Geography*, a town of Moravia, in the circle of Olmutz; 12 miles N.N.W. of Olmutz. N. lat. 49° 42'. E. long. 17°.

UNIEGOW, a town of the duchy of Warſaw; 18 miles S.W. of Lenczicz.

UNIEH, a town of Aſiatic Turkey, in Natolia; 40 miles E. of Samſoum.

UNIEJOW, a town of the duchy of Warſaw; 15 miles N.N.E. of Siradia.

UNIENOW, a town of the duchy of Warſaw; 20 miles E.S.E. of Kaliſch.

UNIFOLIUM, in *Botany*, Dill. Nov. Gen. 138. t. 7, is ſo called, not becauſe it bears a ſingle leaf only, which is not the caſe, but becauſe it ſprings out of the ground with a ſolitary leaf, and is ſome time before it acquires more. The plant in queſtion is *Convallaria bifolia* of Linnæus, whoſe flowers are four-cleft, or rather have four petals and four ſtamens only.

UNIFORM, Uniformis, denotes a thing to be ſimilar, or conſiſtent either with another thing, or with itſelf, in reſpect of figure, ſtructure, proportion, and the like. In which ſenſe it ſtands oppoſed to *difform*.

Uniform, in a *Military Senſe*, ſignifies the ornamental parts of a ſoldier's dreſs, by which one regiment is diſtinguiſhed from another. See Regimentals.

Uniform or *Equable Motion*. See Motion.

Uniform *Flowers of Plants*. See Polypetalous *Flowers*.

Uniform *Matter*, in *Natural Philoſophy*, that which is all of the ſame kind and texture.

Uniform *Temperament*. See Temperament.

UNIFORMITY, Regularity, a ſimilitude or reſemblance between the parts of a whole. Such is that we meet with in figures of many ſides, and angles reſpectively equal, and anſwerable to each other.

A late ingenious author makes beauty to conſiſt in uniformity, joined or combined with variety.

Where the uniformity is equal in two objects, the beauty, he contends, is as the variety; and where the variety is equal, the beauty is as the uniformity. See Beauty.

Uniformity is particularly uſed for one and the ſame form of public prayers, and adminiſtration of ſacraments, and other rites, &c. of the church of England, preſcribed by the famous ſtat. 1 Eliz. and 13 & 14 Car. II. cap. 4. called the "Act of Uniformity." See Liturgy.

Although it is declared in the Act of Uniformity, "that nothing conduceth more to the ſettling of the peace of the nation, nor to the honour of our religion, and the propagation thereof, than an univerſal agreement in the public worſhip of God," it has been contended, that ſtrict uniformity with regard to points of doctrine and forms of worſhip is not eſſential to the peace of ſociety, and to the honour and prevalence of true religion; and that ſuch an uniformity is inconſiſtent with the preſent ſtate of mankind, poſſeſſing different faculties and talents, and different opportunities and means of inquiry; and that it is, therefore, altogether unattainable. It has been alſo maintained, that, in the province of religion, every man has a right to exerciſe his own judgment, and to ſatiſfy his own conſcience, under the beſt illumination which he is able to obtain; and that the civil magiſtrate, however exalted his rank and extenſive his influence in the community over which he preſides, ought not to interfere in controuling this right, and obſtructing the exerciſe of it. It has been alleged, that every attempt to enforce uniformity of religious faith and worſhip by privations and penalties of a civil and ſecular nature, is a miſapplication of the authority with which he is inveſted, and an extenſion of it beyond its proper province, inconſiſtent with the

the doctrines and spirit of Christianity, and injurious to the rights and claims of peaceable and loyal subjects. Those persons to whom we now refer object to the fundamental principle and professed design of the Act of Uniformity, and they concur with many others in disapproving and condemning the mode and time of its introduction, its pernicious influence in causing a schism or separation among British Protestants, and the indigence and distress to which it reduced a great number of meritorious persons, whose conscientious scruples, exemplary character, and useful services, entitled them to protection and encouragement. To this purpose it has been said, that the conditions of exercising the Christian ministry, which the Act of Uniformity imposed, are such as no civil authority can justifiably enjoin; and that it requires subscription to articles of faith, which Christ, who, as they say, is the supreme head of the Christian church, never established; and unfeigned assent and consent to rites and forms of worship, which neither he nor his apostles ever ordained. Besides, this Act required the clergy to subscribe and declare, "that it is not lawful, upon any pretence whatsoever, to take arms against the king, or any commissioned by him;" a position, as it has been conceived, absolutely subversive of the British constitution, and which the nation, soon after the act of king Charles II., openly acknowledged to be traitorous, detestable, scandalous, and false; and which, if admitted, would have precluded us from enjoying the benefits of the glorious revolution, and our present happy government. By this Act the Puritans, extolled even by Hume as a sect, though their principles appear, in his view of them, so frivolous, and habits so ridiculous, to which the English owe the whole freedom of their constitution, were lamentably separated from the English church; and many of them were thus recompensed by Charles II. for their activity and zeal in restoring him to the British throne.

When Charles II. came to Scotland, says lord Clarendon, (Hist. of the Rebellion, vol. vi. p. 374, 375. 733, 734.) expecting force from that kingdom to restore him "to his father's throne, and the parliament of England resolved to send an army against him, *all* the Presbyterian party greatly opposed it: they were bold in contradicting Cromwell in the house, and crossing all his designs in the city." See Rapin's Hist. of England, vol. xiii. p. 227. 241, 242.

Bishop Burnet says, "these five following persons, all Presbyterians, had the chief hand in the restoration: sir Ant. Ashley Cooper, afterwards earl of Shaftesbury; sir Arthur Annesley, afterwards earl of Anglesey; Denzil Hollis, created lord Hollis; the earl of Manchester; and lord Roberts."—"The Presbyterians and the Royalists," says Hume, "being united, formed the voice of the nation, which called for the king's restoration."

Moreover, the Presbyterians, (whom the king, with too much truth perhaps, used to call *God's silly people*,) trusting to his declaration from Breda, solemnly promising "liberty to tender consciences, and that no man should be disquieted for differences of opinion in matters of religion, which did not disturb the peace of the kingdom;" and, relying upon the fair speeches and assurances of his friends, and some of them perhaps duped by the low cunning of the king, who (a committee of their ministers being sent to him at Breda) ordered them to be in waiting whilst he hypocritically withdrew to perform his private devotions, in which his heart was so enlarged, that his voice was distinctly heard, as he intended it should be, by the ministers in the ante-chamber, devoutly thanking God that he was a covenanted king, (alluding to the solemn league and covenant, to which he had bound himself by the most sacred of oaths,) and that he hoped the Lord would give him a humble, meek, and forgiving spirit. Whether the Presbyterians were deluded by the fair promises of the king and his treacherous friends, or were pressed by the civil discord which at that time subsisted, and alarmed at the dreadful disorders into which they apprehended the nation was again running,—be this as it may, they were so infatuated as to trust to the honour of Charles II., and, without previously settling any conditions, they were highly instrumental in restoring him to the throne. Their folly was only equalled by the base ingratitude with which he requited them.

Two years had scarcely elapsed before the Act of Uniformity was, by a small majority, passed into a law, which not only cast out of their livings two thousand ministers, some of whom had helped forward his restoration, but exposed them and their distressed families to numerous sufferings. The gaols were soon filled with the unhappy restorers of this ungrateful king; their houses were pillaged; their families reduced to beggary and want. An estimate was published of near eight thousand Protestant dissenters, who perished in prison by their sufferings on a religious account, in the reign of this perjured, perfidious prince; and, by the severe penalties inflicted on them, for no other crime but that of assembling to worship God, they suffered in their trades and estates, in the compass of a few years, at least, it is said, two millions. Crit. Hist. of England. Neal's Hist. of the Puritans, vol. iv.

This was the king who had himself three several times taken the Scots covenant, declared solemnly his detestation of Popery and Prelacy, vowed never to tolerate them in any part of his dominions, and, in the most solemn manner, swore, by the eternal and almighty God, who liveth and reigneth for ever, that he would not only enjoin the covenant, but fully establish Presbyterian government, and their directory for worship, and observe them in his own practice and family, and never oppose them, nor endeavour any change.

Besides, we may here adduce the historical fact, that the Puritan or Presbyterian clergy were the only body of men in the whole kingdom, who had the courage to oppose and to protest openly against the trial and condemnation of Charles I. Their long and spirited protest was signed by above fifty of the principal Presbyterian ministers in and about London, and presented Jan. 18, 1648–9. See Burnet's Hist. of his own Times, vol. ii. p. 31. Echard's Hist. of England, p. 654. 708. See also the histories of Clarendon, Rapin, &c. &c.

"Bartholomew day," says Mr. Locke, "was fatal to our church and religion, by throwing out a very great number (about two thousand) of worthy, learned, pious, orthodox divines, who could not come up to this oath, and other things in that act. And so great was the zeal in carrying on this church affair, and so blind in the obedience required, that if you compute the time of passing this act with that allowed for the clergy to subscribe the book of Common Prayer thereby established, you will find it could not be printed and distributed so as that one man in forty could have seen and read the book they did so perfectly assent and consent to."—"The matter was driven on," says bishop Burnet (Hist of his Times, vol. i. p. 212, 8vo.) "with so much precipitation, that it seemed expected the clergy should subscribe implicitly to a book they had never seen. This was done by too many, as the bishops themselves informed me." Among these were several, who, according to Mr. Locke's description of them, were "taught rather to obey than to understand."

It

It has been much lamented by many, eminently learned and strictly conscientious, members of the church, both clergy and laity, that the obligation to subscribe assent and consent to a variety of articles of faith and forms of worship, of doubtful and disputable evidence and utility, enjoined and enforced by the Act of Uniformity, should still remain as an indispensable condition of obtaining honourable and useful offices both in the church and state; more especially at a period when liberal sentiments, with regard to controversial subjects, are generally entertained both by clergy and laity; when the right of private judgment and free inquiry is universally acknowledged; and when the governors of the church and the legislature of the state seem disposed to uphold and promote the interests of religious liberty. Attempts have been made to widen the door of admission into the church, and to remove the impediments that lie in the way of advancement to civil offices of trust and profit. Hitherto they have proved ineffectual; but when it shall be perceived that neither the established religion of the country nor the safety of the state can suffer any detriment from a greater latitude in this respect, scrupulous consciences will be relieved, the church will gain an accession of ornament and support, and an union of many interests and services give strength and stability to the constitution and government of the country. On the general subject which has now engaged attention, different opinions have been maintained; and the Editor hopes that the candid reader will find them impartially stated, as far as the limits of this work allow, under the articles CHURCH, CLERGY, LITURGY, RELIGION, SUBSCRIPTION, TEST, TOLERATION, &c. &c.

UNIGENITUS, called also *the Constitution*, in *Ecclesiastical History*, a famous bull, deriving its denomination from the first word of it, which was issued in 1713 by pope Clement XI., and in which Quenel's book, entitled "Moral Reflections on the New Testament," was condemned, and a hundred and one propositions contained in it were pronounced heretical. This bull gave a favourable turn to the affairs of the Jesuits; but it was highly detrimental to the interests of the Romish church, as many of the wiser members of that community candidly acknowledge. For it not only confirmed the Protestants in their separation, by convincing them that the church of Rome was resolved to adhere to its ancient superstitions and corruptions, but also offended many of the Roman Catholics, who had no peculiar attachment to the doctrines of Jansenius, against which this bull was levelled, and were only bent on the pursuit of truth, and the advancement of piety. See JANSENISM.

The dissensions and tumults excited in France by this edict were in the highest degree violent. A considerable number of bishops, among whom was the cardinal de Noailles, archbishop of Paris, and a large body, composed of persons eminently distinguished for their piety and erudition, both among the clergy and laity, appealed from the bull to a general council; and hence those who reject the authority of the bull are called *appellants*; which see. However, the issue of this famous contest was favourable to the bull, which was at length rendered valid by the authority of the parliament, and was registered among the laws of the state. Mosheim's Eccl. Hist. vol. v. 8vo.

UNJIGAH, or *Peace River*, in *Geography*. See PEACE *River*.

UNILOCULAR CAPSULE, among *Botanists*. See CAPSULE.

UNIOLA, was so named by Linnæus, as he himself informs us, *Phil. Bot.* 166, from the union, or rather the aggregation, of several glumes in the calyx; of which, in *Hort. Cliff.* 23, he speaks as the very remarkable character of this genus of grasses, one species only of which had then come under his notice.—Linn. Gen. 35. Am. Acad. v. 7. 195. t. 3. f. 40. Schreb. 49. Willd. Sp. Pl. v. 1. 406. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 1. 159. Pursh 82. Juss. 32. Beauvois Agrost. 74. t. 15. f. 6. Poiret in Lamarck Dict. v. 8. 183. (Briza; Lamarck Illustr. t. 45. f. 3.)—Class and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume many-flowered, of from three to six nearly awl-shaped, compressed, boat-like, minutely keeled valves, alternately imbricated in two rows, each valve closely embracing the next, the upper pair largest, subtending the many-flowered, ovate, greatly compressed, sharp-edged spikelet. *Cor.* of two lanceolate, compressed valves, resembling the calyx, but larger, cloven, acute, without awns. Nectary of two wedge-shaped cloven scales. *Stam.* Filaments three, rarely but one, capillary; anthers oblong, linear. *Pist.* Germen superior, conical; styles two, erect, simple; stigmas downy. *Peric.* none, except the permanent corolla. *Seed* solitary, ovate-oblong, somewhat cylindrical, unconnected with the corolla.

Eff. Ch. Calyx of several valves, many-flowered. Spikelet ovate, awnless, keeled. Seed somewhat cylindrical, unconnected.

1. U. *paniculata*. Panicled Spike-grass. Linn. Sp. Pl. 103. Willd. n. 1, excluding Catesby's synonym. Pursh n. 2. Muhlenb. Cat. 12. (U. maritima; Michaux Boreal.-Amer. v. 1. 71. Uniola; Linn. Hort. Cliff. 23. Gramen μυλοικοφορον οξυφυλλον carolinianum; Pluk. Phyt. t. 32. f. 6.)—Panicle repeatedly compound; partial stalks shorter than the spikelets. Calyx of six valves. Keel of the florets smooth. Leaves involute.—Native of the sandy sea-shores of North America, from Virginia to Florida, perennial, flowering in June and July. *Pursh*. One of the largest and most magnificent of grasses. The *stem* is from four to six feet high, erect, round, jointed, smooth, leafy in the lower part, terminating in an ample panicle eighteen inches long, whose drooping, smooth, compound branches spread in every direction, and bear innumerable, pendent, light brown, or straw-coloured, shining, ovate, very flat spikelets, full an inch long, half an inch broad; some of them nearly sessile. *Florets* about fourteen; the inner valve of their *corolla* a little downy at the edges; keel of the outer sometimes, though rarely, a little rough, not fringed.

2. U. *latifolia*. Broad-leaved Spike-grass. Michaux Boreal.-Amer. v. 1. 70. Muhlenb. Cat. 12. Pursh n. 1. (U. paniculata; Ait. n. 1. Gramen myloicophoron oxyphyllon carolinianum; Catesb. Car. v. 1. t. 32.)—Panicle loose, with capillary stalks, mostly longer than the spikelets. Calyx of three valves. Keel of the florets fringed. Stamen solitary. Leaves lanceolate, flat.—Native of shady woods among rocks, on the Allegany mountains, perennial, flowering in June. *Michaux*, *Pursh*. Near Lancaster, Pennsylvania, flowering in August. *Muhlenburgh*. One of Catesby's original specimens, now in our hands, settles his synonym, hitherto always applied to the foregoing, and is inscribed, in his hand-writing, as follows. "This odd plant or grass growed in a rich bottom, by a creek-side up the west branch of Susqueannah river. I observed but a little spot of it in all my journey." Nothing can be more distinct from the real *paniculata* above described, which is a sea-side plant. The specific characters are abundantly clear. The present is of more slender and less elevated growth, with broad, many-ribbed *leaves*, glaucous beneath. *Panicle* capillary, much less branched. *Spikelets* green or glaucous, of fewer and broader *florets*, which, according to Michaux, are

are monandrous: their keel is rough with short hairs, as well as fringed more or less with longer ones. The *calyx* consists of three unequal valves.

3. U. *racemosa*. Jamaica Spike-grass.—Cluster cylindrical, compound. Spikelets nearly sessile. Calyx of about four valves. Keel of the florets minutely downy. Leaves involute, taper-pointed.—Gathered in Jamaica by Mr. Masson, one of whose specimens was communicated, probably by sir Joseph Banks, to the younger Linnæus. We know not how so fine a species of this elegant genus escaped the notice of Dr. Swartz. It has the aspect of a sea-side grass, having a very stout *stem*, leafy to the very summit. The *leaves* are involute, rigid, with a long very slender point, and broad sheathing base, crowned with a hairy *stipula*: the upper ones, two feet in length, rise high above the flowers. The *panicle* is terminal, solitary, cylindrical, six inches long, with numerous, short, toothed, simple, downy, many-flowered *branches*, each bearing six or eight alternate, nearly sessile, flat, ovate *spikelets*, half an inch long, variegated with green and white. The *florets* are about twelve, ovate, compressed, finely downy at the edges and keel, having three green ribs at each side extending half way down from their point.

4. U. *mucronata*. Pointed Spike-grass. Linn. Sp. Pl. 104. Willd. n. 2.—"Spike two-ranked. Spikelets ovate. Calyx somewhat awned."—Native of the East Indies. *Burmann*. *Stem* a foot high, smooth. *Leaves* narrow, smooth, with striated sheaths. *Spike* of eleven or twelve *spikelets*, which are alternate, in two rows, nearly sessile, ovate, smooth, seven-flowered. The *calyx* is so much pointed as to be almost awned. *Linnæus*. We have seen no specimen. The description was probably made from Burmann's herbarium.

5. U. *spicata*. Two-ranked Spike-grass. Linn. Sp. Pl. 104. Willd. n. 3. Bigelow Bost. 23. Ait. n. 2. (Festuca distichophylla; Michaux Boreal.-Amer. v. 1. 67. Pursh 84, excluding the reference to Plukenet.)—Spike unilateral, dense. Spikelets tumid, sessile, smooth. Leaves involute, pointed, rigid.—Native of salt meadows in North America; common along the coast from Canada to Florida; perennial, flowering in July and August. *Pursh*. The *stem* is much branched, and thickly clothed with rigid, pungent, smooth, sheathing, alternate *leaves*, two or three inches long, rising above the *spikes*, which are terminal, solitary, sessile, about an inch in length. Each *spikelet* consists of four or five broad close *florets*, and the two principal *calyx-valves* are sometimes accompanied by one or two smaller external glumes, which may excuse Linnæus for placing this species here, but we confess it to be a bad *Uniola*. Plukenet's t. 33. f. 4, cited doubtingly by Pursh, bears much resemblance to our plant, but is an English *Triticum*!

6. U. *gracilis*. Slender Spike-grass. Michaux Boreal.-Amer. v. 1. 71. Pursh n. 3. (Holcus laxus; Linn. Sp. Pl. 1486. Willd. Sp. Pl. v. 4. 934.)—"Panicle elongated, somewhat spiked, with short close-pressed branches. Spikelets nearly sessile. Florets monandrous, divaricated, pointed, smooth. Calyx of three valves. Leaves flattish; their sheaths smooth and compressed, like the stem."—In shady rocky situations, from Virginia to Georgia; perennial, flowering in July. *Pursh*. Linnæus compares the habit of the grass to *Aira*, or *Melica, cærulea*. The *stems* are weak, two feet high, a little drooping.

Labillardiere, Nov. Holl. v. 1. 21. t. 24, has an *U. distichophylla*, very nearly related to our *spicata*, but referred to *Poa* by Mr. Brown, Prodr. Nov. Holl. v. 1. 182.

UNION, a junction, coalition, or assemblage of two or more different things in one. Philosophers are much perplexed in accounting for the manner of the union of soul and body, or by what medium it is that two such heterogeneous beings are kept closely together.

It is one of the great laws of this union, that such and such an impression on the brain be followed by such and such a sensation, or perception, in the soul.

Union, in a philosophical sense, is used by Dr. Grew for one of the three ways of mixture; being the joining together of atoms, or insensible particles, so as to touch in a plane; as is supposed to be the case in the crystallizations of salts and the like bodies.

Union, among *Painters*, expresses a symmetry and agreement between the several parts of a painting; when, *e. gr.* there is a considerable degree of relation and connection between them, both as to the figuring and the colouring; so that they apparently conspire to form one thing.

Union, in *Architecture*, may denote a harmony between the colours in the materials of a building.

Union, in an ecclesiastical sense, denotes a combining or consolidating of two or more churches into one.

This is not to be done without the consent both of the bishop, the patron, and the incumbent.

The canonists distinguish three kinds of union; that of *accession*, that of *confusion*, and that of *equality*.

Union *of Accession* is the most usual; by this the united benefice becomes a member, and accessory of the principal.

Union *by Confusion*, is that where the two titles are suppressed, and a new one created, including both.

Union *of Equality*, is that where the two titles subsist, but are equal and independent.

The union or consolidation of churches ought to be founded upon good canonical reasons; and the principal reasons assigned by the canon law are, for hospitality, nearness of the places, want of inhabitants, poverty or smallness of the living. These several circumstances must be inquired into before the union; and some, or all of them, are recited in the preamble to the act of union.

In such case, by the common law of the realm, the ordinaries, patrons, and incumbents, may make a consolidation or union of the two churches into one. (1 Salk. 165. Hughes, c. 28.) Moreover, in such case, it is said, that the consent of the king is not at all necessary, although he hath an interest in the churches in the case of lapse. For by the ancient canon law, the licence of the pope was not necessary; nor has the licence of the king been thought necessary since the reformation. In some instances, however, it has been desired and obtained for the greater caution. Cro. Eliz. 500. Gibson. Watson.

By stat. 37 Hen. VIII. c. 21. it is enacted, that an union or consolidation of two churches, or of a church and chapel, into one, may be admitted, provided the annual value of one of them, in the king's books, doth not exceed 6*l.*, and the distance between them be not above one mile.

This union supposes the assent of the ordinary and ordinaries of the diocese where such churches and chapels stand, and the assent of the incumbents of them, and of all such as have a just right, title, and interest to the patronage of the same churches and chapels, being then of full age. This union shall be available in the law, to continue for ever; provided that where the inhabitants of any such poor parish, or the more part of them, within one year next after the union or consolidation of the same parish by their writing sufficient in the law, shall assure the incumbent of the said parish, for the yearly payment of so much money as with the sum that the said parish is rated and valued at in the court of first fruits and tenths, shall amount to the full sum of

of 8*l*., to be levied and paid yearly by the faid inhabitants to the faid incumbent and his fucceffors; all fuch unions or confolidations made of any fuch poor parifh as aforefaid, fhall be void and of none effect.

By the fame ftatute, it is provided, that all unions and confolidations, to be made of any church or chapel within any city or town corporate, without the affent of the mayor, fheriffs, and commonalty of fuch city, or without the affent of the body corporate of other towns corporate, by the names of their corporations in writing under their common feal, fhall be void.

By 21 Hen. VIII. c. 13. f. 9. if any perfon having one benefice with cure, of the yearly value of 8*l*., or above, take any other with cure, and be inducted in poffeffion of the fame; then immediately after fuch poffeffion, the firft benefice fhall be void. And by f. 10. it fhall be lawful for the patron to prefent; any licence, union, or other difpenfation, to the contrary thereof notwithftanding. By which word *union* there is meant not a perpetual. but a temporary union during the life of an incumbent. (Gibf. Cod. 970. art. 7.) And this is there clearly proved, firft by the words of the union, and alfo by the cafe of Page *v*. Bp. of London. Cro. El. 719, 720.

And by another ftat. 17 Car. II. c. 3. it is enacted, that the union of two churches, or chapels, in any city or town, by the bifhop, patron, and chief magiftrate of the town, fhall be valid, unlefs the value of the churches fo united exceed 100*l*.

By the union the two churches are become fo much one, that a fecond benefice may be taken by difpenfation within the ftatute of pluralities. (Cro. Eliz. 720. Gibfon 920.) If any queftion arife concerning the union, after it is eftablifhed, this may not be tried in the temporal, but only in the fpiritual court; unlefs it be fuch union as is reftrained by the aforefaid ftatutes. Watf. c. 16.

UNION, *Hypoftatical*. See HYPOSTATICAL.

UNION, or *The Union*, by way of eminence, is more particularly ufed, among us, to exprefs the act by which the two feparate kingdoms of England and Scotland were incorporated into one, under the title of *the Kingdom of Great Britain*.

The kingdom of Scotland, notwithftanding the union of the crowns on the acceffion of their king James VI. to that of England in 1603, continued an entirely feparate and diftinct kingdom for above a century more, though an union had been long projected; which was judged to be the more eafy to be done, as both kingdoms were anciently under the fame government, and ftill retained a very great refemblance, though far from an identity, in their laws. By an act of parliament (1 Jac. I. cap. 1.) it is declared, that thefe two mighty, famous, and ancient kingdoms, were formerly one. And fir Edward Coke obferves, how marvellous a conformity there was, not only in the religion and language of the two nations, but alfo in their ancient laws, the defcent of the crown, their parliaments, their titles of nobility, their officers of ftate and of juftice, their writs, their cuftoms, and even the language of their laws: upon which account he fuppofes the common law of each to have been originally the fame. However, fir Edward Coke, and the politicians of that time, conceived great difficulties in carrying on the projected union; but thefe were at length overcome, and the great work was happily effected in the year 1707, by the general confent of the queen, and the eftates of each realm.

The act or treaty of union confifts of twenty-five articles; which eleven Englifh commiffioners, and eleven Scotch ones, examined, approved, and figned on the 3d of Auguft 1706. The parliament of Scotland approved it on the 4th of February 1707, and the parliament of England on the 10th of March in the fame year. On the 17th following the queen went to parliament, where fhe approved the fame treaty, with the act of ratification.

The purport of the moft confiderable articles is as follows: 1. That on the 1ft of May, 1707, and for ever after the kingdoms of England and Scotland fhall be united into one kingdom, by the name of Great Britain. 2. The fucceffion to the monarchy of Great Britain fhall be the fame as was before fettled with regard to that of England. 3. The united kingdom fhall be reprefented by one parliament. 4. There fhall be a communication of all rights and privileges between the fubjects of both kingdoms, except where it is otherwife agreed. 9. When England raifes 2,000,000*l*. by a land-tax, Scotland fhall raife 48,000*l*. 16, 17. The ftandards of the coin, of weights and meafures, fhall be reduced to thofe of England throughout the united kingdoms. 18. The laws relating to trade, cuftoms, and the excife, fhall be the fame in Scotland as in England, But all the other laws in Scotland fhall remain in force, but alterable by the parliament of Great Britain; yet with this caution, that laws relating to public policy are alterable at the difcretion of the parliament; laws relating to private right are not to be altered, but for the evident utility of the people of Scotland. 22. Sixteen peers are to be chofen to reprefent the peerage of Scotland in parliament, and forty-five members to fit in the houfe of commons. 23. The fixteen peers of Scotland fhall have all privileges of parliament; and all peers of Scotland fhall be peers of Great Britain, and rank next after thofe of the fame degree at the time of the union, and fhall have all privileges of peers, except fitting in the houfe of lords, and voting on the trial of a peer.

Thefe are the principal of the twenty-five articles of union, which are ratified and confirmed by ftatute 5 Anne, cap. 8. in which ftatute there are alfo two acts of parliament recited; the one of Scotland, by which the church of Scotland, and all the four univerfities of that kingdom, are eftablifhed for ever, and all fucceeding fovereigns are to take an oath inviolably to maintain the fame; the other of England, 5 Anne, cap. 6. by which the acts of uniformity of 13 Eliz. and 13 Car. II. (except as the fame had been altered by parliament at that time), and all other acts then in force for the prefervation of the church of England, be declared perpetual; and it is ftipulated, that every fubfequent king and queen fhall take an oath inviolably to maintain the fame within England, Ireland, Wales, and the town of Berwick-upon-Tweed; and it is enacted, that thefe two acts fhall for ever be obferved as fundamental and effential conditions of the union.

The great officers of the crown of Scotland, before the union, were, the lord high chancellor, lord high treafurer, or treafurer, lord privy feal, and lord regifter, or fecretary. Their lefs officers of ftate were, the lord regifter, lord advocate, lord treafurer depute, and lord juftice clerk.

Since the union, the officers of ftate in Scotland are the keeper of the great feal, lord privy feal, lord regifter, lord vice-admiral, lord juftice general, lord prefident, lord chief baron of the exchequer, lord advocate, lord juftice clerk, lord high conftable, heretable royal ftandard bearer, knight marefchal, heretable keeper of the king's houfhold, heretable carver, and heretable ufher of the white rod. The privy council of Scotland is funk in the parliament and privy council of Great Britain, and the civil and criminal caufes are chiefly cognizable

cognizable by two courts of judicature, viz. the college of justice, or the court of session, and the justiciary court, under the direction of the lord justice general, the lord justice clerk, five commissioners, his majesty's advocate, three deputy advocates, a solicitor-general, &c. Besides these two great courts of law, the Scots, by the articles of union, have a court of exchequer, under the direction of a lord chief baron, and four barons. The court of admiralty in Scotland is a supreme court in all cases competent to its jurisdiction, and under the direction of the lord vice-admiral, a judge, procurator fiscal, &c. The courts of commissaries in Scotland answer to those of the English diocesan chancellors; the highest of which is kept at Edinburgh, in which, before four judges, actions are pleaded concerning wills, the right of patronage to ecclesiastical benefices, tithes, divorces, and such causes. The office of privy seal is under the direction of the lord privy seal, a deputy writer to the privy seal, and his deputy. The great seal office is under the direction of the lord keeper, and deputy and king's writer. The lord register's office is under the superintendance of the lord register, and six deputies. The chancery is under the administration of a director, deputy, and principal clerk. See College *of Heralds*, and University.

Under this article of union we may observe, with respect to Wales, that very early in our history, we find its princes doing homage to the crown of England; till at length, in the reign of Edward I. the line of its ancient princes was abolished; and the king of England's eldest son became, as a matter of course, their titular prince; the territory of Wales being then entirely annexed (by a kind of feudal resumption) to the dominion of the crown of England. (10 Edw. I.) By 12 Edw. I. and other subsequent statutes, their provincial immunities were farther abridged; but the finishing stroke to their independency was given by the statute 27 Hen. VIII. cap. 26. which at the same time admitted them to a thorough communication of laws with the subjects of England. By this statute it is enacted, 1. That the dominion of Wales shall be for ever united to the kingdom of England. 2. That all Welshmen born shall have the same liberties as the other king's subjects. 3. That lands in Wales shall be inheritable according to the English tenures and rules of descent. 4. That the laws of England, and no other, shall be used in Wales; besides many other regulations of the police of the principality. And the statute 34 & 35 Hen. VIII. cap. 26. confirms the same, adds farther regulations, divides it into twelve shires, and, in short, reduces it into the same order in which it stands at this day; differing from the kingdom of England in only a few particulars, and those too of the nature of privileges (such as having courts within itself, independent of the process of Westminster-hall), and some other immaterial peculiarities, hardly more than are to be found in many counties of England itself.

The town of Berwick-upon-Tweed was originally part of the kingdom of Scotland; and as such was for a time reduced by king Edward I. into the possession of the crown of England; and during its subjection, it received from that prince a charter, which (after its subsequent cession by Edward Baliol, to be for ever united to the crown and realm of England) was confirmed by king Edward III. with some additions, particularly that it should be governed by the laws and usages which it enjoyed before its reduction by Edward I. Its constitution was new-modelled, and put on an English footing by a charter of king James I.; and all its liberties, franchises, and customs, were confirmed in parliament by the statutes 22 Edw. IV. cap. 8. and 2 Jac. I. cap. 28. Though, therefore, it has some local peculiarities, derived from the ancient laws of Scotland, yet it is clearly part of the realm of England, being represented by burgesses in the house of commons, and bound by all acts of the British parliament, whether specially named or otherwise. Accordingly it was declared by statute 20 Geo. II. cap. 24. that, where England is only mentioned in any act of parliament, the same notwithstanding hath and shall be deemed to comprehend the dominion of Wales, and town of Berwick-upon-Tweed. And though certain of the king's writs or processes of the courts of Westminster do not usually run into Berwick, any more than the principality of Wales, yet it hath been solemnly adjudged, that all prerogative writs (as those of mandamus, prohibition, habeas corpus, certiorari, &c.) may issue to Berwick, as well as to every other of the dominions of the crown of England; and that indictments, and other local matters arising in the town of Berwick, may be tried by a jury in the county of Northumberland.

Union, *Legislative*, between Great Britain and Ireland. Amongst the important events which will in future times distinguish the reign of George III. and the administration of William Pitt, is the legislative union which this statesman effected between Great Britain and Ireland; a measure which, in the opinion of its advocates, has consolidated the strength of the empire, and thus contributed to its prosperity; whilst by others it is supposed to have destroyed the independence of one country, and to have added to the influence of the crown or its ministers in the other. To pass over such a measure without some account of the circumstances which attended it, would be a defect in a work of this nature; yet to treat it so as to give general satisfaction cannot be expected, whilst many who took an active part in promoting or opposing it are still alive, and whilst all the measures likely to result from it have not yet taken effect.

The first consideration in forming an opinion on this question, is the previous state of legislation in Ireland, and the nature of the connection between the two countries. Under the article Ireland there is a brief historical detail of the manner in which Ireland became connected with England, and of the succeeding events, to which the reader is referred. From this account it is evident that Ireland was always considered as a *dependent* country; and whether the right was derived from voluntary submission, from conquest, or from colonization, it has been long regarded as an axiom in Irish politics, that whosoever is king of England, the same is *ipso facto* king of Ireland. It was entitled the dominion, or lordship of Ireland, stat. Hiberniæ, 14 Hen. III. and the king's style was no other than *dominus Hiberniæ*, lord of Ireland, till the 33d year of king Henry VIII. when he assumed the title of king, which is recognized by act of parliament 35 Hen. VIII. cap. 3. With a view to secure this authority in its fullest extent, Poynings' law was established in the reign of Henry VII. by which no law could be enacted in Ireland, which had not been previously submitted to the king and his council in England, approved by them, and certified under the great seal of the realm. (See Poynings' *Law*.) This was found necessary at first to check the king's representatives, who had often a private interest at variance with that of their master; and it was afterwards thought expedient to prevent the descendants of the English colonists from pursuing their own interest at the expence of that of the mother-country. But though the dependance of Ireland, in a political point of view, was thus apparent, it was reserved for the reign of George I. to assert legislative

authority,

authority, which was done first by the reversion of a sentence of the Irish house of lords by the English house, as a superior court of judicature, and then by a solemn declaration of a right, not only to make such reversions in all cases of appeal, but also that the king's majesty, with the consent of the lords and commons of Great Britain in parliament, had power to make laws to bind the people of Ireland. When the present king, George III., ascended the throne in 1760, two-thirds of the people of Ireland, depressed by severe penal laws, not only were not represented in the parliament by which they were taxed, but were considered as aliens, undeserving of any protection. The remaining third was represented by three hundred members, of which about one hundred were chosen by counties or large towns, and the remainder by boroughs, most of which had been constituted in the time of the Stewarts, to create a Protestant majority of the house of commons, and had become the property of a few individuals. The members thus chosen sat for their own lives, or that of the sovereign; no general election taking place except on the demise of the crown. The executive government was committed nominally to a viceroy, but essentially to lords justices, selected from the principal state officers of the country, who were entrusted with the conduct of what was called the king's business, but which might with more propriety have been called the business of the lords justices. The viceroy came to Ireland for a few months only in two years, and the lords justices in his absence had the means of consolidating an aristocratic influence, which made them the necessary instruments of the English government. As no acts could pass without the previous approbation of the king in his English council, it was usual to agree with some of the Irish leaders on a compromise that the minister would forward their local objects, provided they undertook to carry through parliament those bills which he required. What could be expected from such a system of government? What but a system of peculation and oppression, such as perhaps was scarcely ever witnessed in any other country? The object, it may be said the mistaken policy of the British government, was, in the words of Mr. Pitt, "to debar Ireland from the enjoyment and use of her own resources, and to make her completely subservient to the interests and opulence of Britain;" and whatever resistance might be occasionally shewn, the general tenor of conduct of the Irish parliament was to promote the destructive views of Britain, which the members made conducive to their own individual interests. "The inevitable final result of this unpropitious combination," to use the words of Mr. Newenham in his View of the Natural, Political, and Commercial Circumstances of Ireland, published in 1809, "was a very scanty and disproportionate acquisition of commercial wealth on the part of Ireland, and an almost utter extinction of a spirit of industry therein. To cramp, obstruct, and render abortive the industry of the Irish, were the objects of the British trader. To gratify commercial avarice, to serve Britain at the expence of Ireland, or to facilitate the government of the latter, were the varying objects of the British minister. To keep down the Papists, cost what it would, and to augment their own revenues by the public money, instead of urging the adoption of wise, liberal, and patriotic measures calculated to quadruple the rents of their estates, were the objects of the reputed representatives of the Irish people; and to secure themselves from retaliations on the part of the Roman Catholics, whom they were encouraged to persecute and taught to dread, was the general object of the Irish gentry." To this deplorable state of Ireland, we have to add the non-residence of the principal landed proprietors, and the frequent disturbances which under various pretences were raised in different parts of the country. In short, Ireland was in a state which could hardly be rendered worse, and which required some speedy melioration.

The measure of a legislative union had occurred to several as the best mode of rendering Ireland a valuable part of the British empire. Oliver Cromwell, during the period of his usurped power, actually carried it into effect: in the reign of queen Anne, the Irish house of lords petitioned for such an incorporation; and the great earl of Chatham is said to have regarded it as a favourite object. Now, though he and others might have had the interest of England immediately in view, yet it is an undoubted fact, that the interests of both countries are so closely united, that it is impossible to make Ireland contribute to the welfare of England without promoting its internal prosperity. The *avowed* object, it is said, was an object of taxation; but he must be a statesman of a very different cast from lord Chatham, who could expect to derive revenue from an impoverished country like Ireland, until he had awakened a spirit of industry, had civilized, improved, and enriched the people. Those, however, who derived benefit from the system then acted on, such as the parliamentary leaders, were not backward in expressing their dislike of a union, and they were supported by those whose vanity was pleased by the name of an independent legislature, as well as by those unfriendly to British connection. So odious was the measure, that in 1759, at a time when Ireland was threatened by a French invasion, the bare suspicion of its being in contemplation caused a spirit of dissatisfaction to break out with extraordinary violence among the populace of Dublin. It was represented that Ireland would be deprived of its parliament and independence, and be subjected to the same taxes that are levied upon the people of England. On this occasion both houses of parliament, especially the lords, were grossly insulted; the members were compelled to take an oath that they would never consent to such a measure; and, at last, military interference was found necessary to the restoration of order. This mode of influencing parliamentary proceedings by the threatenings of a mob, which was not unusual at a much later period in the Irish capital, proves the necessity of some change in the system of legislation. In the reign of George III. many measures were adopted which contributed to give weight to the anti-union party, and which certainly promoted the improvement and prosperity of the country. Parliaments were rendered octennial, and their sessions annual; many penal laws were repealed or modified; agriculture was encouraged; and a spirit of industry excited. In the mean time, Britain was weakened by its contest with its American colonies; and the demands of the Irish parliament, backed by 40,000 volunteers, procured a liberation of trade from unjust restrictions, and the establishment of legislative independence. This independence, however, was merely nominal; the influence of the British minister still directed the measures of the Irish parliament at a greater expence to the nation, and there were many difficulties from the want of some regular mode of considering the commercial interests of both countries: "some general superintending authority," as Mr. Fox said, "to embrace and comprehend the whole system of the navigation of the empire." In 1785, Mr. Pitt attempted to remedy this evil by a commercial arrangement, which, whilst it held out great advantages to Ireland, stipulated that so long as Ireland continued to trade with the British colonies and plantations, she would adopt the regulations of trade

and

and navigation imposed by the British parliament on British subjects in carrying on the same trade. This interference with the independence of Ireland defeated the measure of the British minister, though he was assisted on this occasion by the talents and knowledge of Mr. Foster, then chancellor of the Irish exchequer. On this occasion, lord Sackville, better known perhaps as lord George Germaine, the title he bore when in office, earnestly recommended a legislative union as the only mode of settling the jarring interests of the two countries; and it is thought that from that time the measure became a favourite object of the British ministry. Several political writers had indeed warmly recommended it. Dean Tucker observed, that "to incorporate both the British isles together, and make one kingdom, in all respects, as to parliament, trade, and taxes, had long been the wish of every generous disinterested patriot of both kingdoms:" and in 1785, after the rejection of the commercial propositions, he said, "respecting Ireland, one or other of the same consequences (union or separation) must inevitably follow. For after tropes and figures have been let off without number, after torrents of eloquence have been poured forth, much paper blotted, and much ink spilled,—recourse must be had, at last, either to a *separation*, or to a *union;* for plainly there is no other alternative; no other medium to be discovered, or cement which can last for any length of time." The result of Arthur Young's examination into the state of Ireland, seems to have been a similar conviction; and the distinguished author of the Inquiry into the Nature and Causes of the Wealth of Nations, book v. chap. 3, after speaking of the commercial advantages resulting from a union, says, that Ireland would gain other advantages much more important. "The greater part of the people of all ranks would gain a complete deliverance from an aristocracy, not founded in the natural and respectable distinctions of birth and fortune, but in those of religious and political prejudices: distinctions which, more than any other, animate both the insolence of the oppressors, and the hatred and indignation of the oppressed; and which commonly render the inhabitants of the same country more hostile to one another, than those of different countries ever are.—The spirit of party prevails less in Scotland than in England. In the case of a union, it would probably prevail less in Ireland than in Scotland. Without a union with Great Britain, the inhabitants of Ireland are not likely for many ages to consider themselves as one people." From an anecdote recorded by sir John Dalrymple, and quoted by Mr. Goold, one of the many writers against the union, it appears that in 1776, the earl of Rochford being offered the lord lieutenancy of Ireland, was willing to accept the office if he could do some great good there, and get some great fame, and that two objects occurred to him, the one to procure a repeal of the penal laws against Roman Catholics, and the other to bring about a union with England. He sent to consult lord Harcourt, then lord lieutenant, and his intimate friend, about these measures; and though lord Rochford had at first deemed them visionary, and lord Harcourt pointed out such difficulties as prevented his friend from undertaking them, still it is evident that both noblemen regarded them as measures calculated to promote the general welfare. The opposition to a union, which lord Harcourt apprehended in 1776, would have been greater in 1785. "To carry this into effect," says Mr. Newenham, "was an achievement which required much time; much address; much vigilance, with regard to opportunities; much discernment, with regard to selection; much promptitude, and much energy during the season of action; for the parliament of Ireland had become attached to its aristocracy; and the people of Ireland had been rendered enthusiastic in behalf of national independence, and exemption from the paralysing controul of Britain. Indeed, as the writer well remembers, it was considered as almost amounting to treason against the nation, to utter a syllable in favour of a union. The parliament was studious to preserve independence, chiefly on account of its tendency to enhance the services of individual members. The people were studious to preserve it, because it afforded them a better prospect of patriotic measures than they had before. But they were also anxious to reform the parliament, in order to insure the adoption of those measures which the private interests of a majority of the members induced them to oppose."

In 1785, then, all parties would have joined in rejecting a union with abhorrence; and the minister found it necessary to give up his commercial system, though beneficial to Ireland, because it involved a partial surrender of legislative independence. Circumstances however occurred, which rendered some means of strengthening the connection between the two countries absolutely necessary.

In 1788 it pleased God to afflict our good and beloved king with a malady which disabled him from exercising his royal functions. The parliament of Great Britain determined, after long deliberations, to appoint the prince of Wales regent, with restrictions; and whilst their deliberations depended, the parliament of Ireland met, and almost instantaneously resolved that an address should be presented to the prince, requesting him to take upon himself the government during his majesty's indisposition, under the style and title of prince regent of Ireland. There was here a choice of a regent before the British parliament had come to a decision, and though the choice fell on the same personage, yet that personage would have had different powers in the two kingdoms. It was a proof indeed of independence, but it was inconsistent with the connection; for if Ireland could choose her regent, her choice might fall on a different individual from the regent of Great Britain. The convalescence of the king prevented any evil; but the conduct of the Irish parliament supplied the advocates of union with a powerful argument: and if Mr. Pitt had been before undecided, this would probably determine him to take the first opportunity of carrying it into effect. In the mean time many circumstances prepared the way. The disturbances respecting tithes contributed to religious dissentions; the Protestants became alarmed at the idea of a Popish parliament; and the Catholics were irritated at what they conceived their just rights being withheld. In 1792 the Catholics presented two petitions to the house of commons, the first of which was withdrawn, and the second was rejected on a division of 228 to 25; and it was complained that the Catholics of Ireland had not influence to induce any one member of parliament to patronize their petition, so faint was the support given to it, even by those who voted for receiving it. Yet in the next session of parliament, without any change of circumstances in the country, the same house of commons, which had refused to allow the petition of three-fourths of their countrymen to lie on their table, on the recommendation of the crown passed a bill, granting every privilege for which the Catholics had petitioned, and even without the restrictions on the right of voting, which they had themselves proposed. Could any proceeding have tended more to destroy the confidence of the people in their representatives?

In 1795, during the viceroyalty of lord Fitzwilliam, the Catholics

Catholics were led by the friends of that nobleman in Ireland to bring forward their demand for a full emancipation with a prospect of success; and soon after, in consequence either of the English cabinet having changed their opinion, or of his lordship having gone beyond his agreement with them, he was recalled, and a considerable irritation of the Catholic body was the consequence. This was taken advantage of by those who had revolutionary feelings, and who well knew how to avail themselves of the popular ferment. Instigated by the success of the French, and maintaining a secret communication with the republican government, an organization of the people took place; a directory was formed, which consisted of leading members of the society of united Irishmen; and in 1798, a rebellion broke out, which, though soon subdued, was attended by circumstances that left the country in a very distracted state. If the first French expedition, in 1796, had not been dispersed by a storm; and the second, in 1798, been too late to act in concert with the rebels, Ireland would, in all probability, have felt the evils of separation from England, and of French connection, and the people would have learned from bitter experience to value the privileges of British subjects; but disappointed of foreign aid, the rebels were shortly reduced, and it became the arduous task of government, by a combination of vigour and of mercy, to restore tranquillity. It has indeed been asserted, that government could have suppressed the rebellion without any effort, or rather have entirely prevented it; but that they facilitated its growth, and accelerated its explosion, with a view to bring about their favourite measure of union. The confession of the members of the Irish directory, and other leaders, afford ample proof to every candid person that such a charge is unfounded; and that if ministers had acted in the manner recommended by their parliamentary opponents, all exertion to save the country would have been in vain. Such a charge is equally the result of party virulence, as that which attributed to Mr. Grattan and his Whig friends a participation in the rebellion. But though it would be uncandid to suppose that government excited or facilitated the rebellion with a view of bringing about the union, it is certain, that when this auspicious conjuncture did occur, the minister lost no time in bringing it forward. The rebellion took place in 1798, and in the succeeding session of parliament the union was discussed.

Previous, however, to the meeting of parliament, a pamphlet published in favour of the measure, which was attributed to Edward Cooke, esq. one of the under-secretaries, produced a controversy, which was carried on with much spirit. The repugnance to the measure was very great; some of the principal officers of the crown declared their determination to oppose it, and lost their situations in consequence; the majority of the gentlemen of the bar took the same side, and several meetings of counties and large towns were held for the purpose of instructing their representatives to oppose it. Some of these were influenced by the utter incompatibility of the union with their private interests, and others by high notions of Irish independence, as settled in 1782.

On the 22d of January, 1799, the question of union was regularly brought before parliament by the marquis Cornwallis, the lord lieutenant, who concluded his speech from the throne in these words; "The more I have reflected on the situation and circumstances of this kingdom, considering on the one hand the strength and stability of Great Britain, and on the other those divisions which have shaken Ireland to its foundation, the more anxious I am for some permanent adjustment, which may extend the advantages enjoyed by our sister kingdom to every part of this island. The unremitting industry with which our enemies persevere in their avowed design of endeavouring to effect a separation of this kingdom from Great Britain, must have engaged your particular attention; and his majesty commands me to express his anxious hope that this consideration, joined to the sentiment of mutual affection and common interest, may dispose the parliaments in both kingdoms to provide the most effectual means of maintaining and improving a connection, essential to their common security, and of consolidating, as far as possible, into one firm and lasting fabric, the strength, the power, and the resources of the British empire."

The address, which was moved by the earl of Tyrone, eldest son of the marquis of Waterford, the head of the Beresford family, and seconded by colonel Uniacke Fitzgerald, one of the members for the county of Cork, only intimated a readiness to discuss any measure likely to cement and strengthen the connection, but the opposers of it would not allow even of this. An amendment was accordingly moved by Mr. George Ponsonby, an eminent barrister, who since filled the high office of lord chancellor of Ireland during the lieutenancy of the duke of Bedford, and on retiring from it, became leader of the opposition in the British parliament, a man of great talents united with great moderation and judgment, and seconded by sir Laurence Parsons, now earl of Ross, and one of the postmasters-general. The amendment was, that after the passage which declares the willingness of the house to enter on a consideration of what measures may best tend to confirm the common strength of the empire, should be inserted, "maintaining, however, the undoubted birth-right of the people of Ireland to have a resident and independent legislature, such as it was recognised by the British legislature in 1782, and was finally settled at the adjustment of all differences between the two countries." This amendment was supported by sir John Parnell and Mr. J. Fitzgerald, who had been just removed from the offices of chancellor of the exchequer and prime serjeant, by the friends of Mr. Foster, the speaker, by Mr. Plunket, and many others, distinguished for their talents, or their influence in the country. A legislative union was however approved by several who could not be justly suspected of improper motives, and amongst others by the right honourable Thomas Conolly, who used the strong expression, "that the constitution of 1782 could not work, two independent legislatures in one empire being as absurd and monstrous as two heads on one pair of shoulders." This was indeed a striking reason for a union of legislatures, or some other expedient, if any other could be devised, which would preclude all possible future collisions of supposed national interests, especially with regard to commercial matters. In this debate, however, the advocates for a union chiefly confined themselves to urging the propriety of discussing the measure coolly and impartially, when it had been recommended by the crown. The opposers of it took a wider range. Almost all the lawyers who spoke denied the competence of parliament to entertain the question. In 1785, Mr. Grattan had maintained "that parliament was not omnipotent to accomplish their own destruction, and propagate death to their successors; that they, the limited trustees of delegated powers, born for a particular purpose, confined to a particular time, and bearing an inviolable relationship to the people who sent them to parliament, could not break that relationship, counteract that purpose, or derogate from those privileges they lived but to preserve." This opinion was maintained by several, and Mr. Plunket, one of the most eloquent speakers, as well as one of the ablest lawyers the country has produced, in express terms denied the

the competency of parliament. "I warn you," said he, "do not dare to lay your hand on the constitution; I tell you, that if, circumstanced as you are, you pass this act, it will be a mere nullity, and that no man in Ireland will be bound to obey it; I make the assertion deliberately, I repeat it, and I call on any man who hears me to take down my words; you have not been elected for this purpose; you are appointed to make laws and not legislatures; you are appointed to act under the constitution, and not to alter it; you are appointed to exercise the functions of legislators, and not to transfer them; and if you do so, your act is a dissolution of the government; you resolve society into its original elements, and no man in the land is bound to obey you." Such is the strong language with which this gentleman is reported to have opposed the union; yet since it has taken place, he has not disdained to be a representative of Ireland in the imperial parliament, and has been heard with that attention and admiration to which he is entitled. The ablest advocate for the competency of parliament was Mr. William Smith, son of the master of the rolls, and since one of the barons of the exchequer, who maintained that a contrary "doctrine would not only impugn the express authority of Coke and Blackstone, and other constitutional writers, but would shake the fabric of our rights and liberties to its foundation; would go to cancel the title-deed of 1706, by virtue of which his majesty holds his Scottish crown; would question the legitimacy of that mixed assembly, which was formed by the coalition of the Scotch and English legislatures; and impeach the force of every statute which has been enacted since their junction: and would confound and violate the very elements of our constitution, by transferring the supreme authority from the parliament to the people." Whilst on this particular subject it may be observed, that the competence of parliament was also maintained by that eminent lawyer Barry, lord Yelverton, who had taken a lead in the measures of 1782. "Union," says he, "is only a law common to two states; and to say that the parliaments of both are incompetent to frame such a law, is to say that they are incompetent to answer the ends of their institution. For a distinction is to be made between the physical and moral power of parliaments. They *can* do any act, but there are certain acts which they *ought* not to do; and therefore every question of *competence*, ultimately resolves itself into a question of *expediency*. And surely it will not be argued, that though Great Britain and Ireland should stand on the precipice of destruction; that though their distinctness must be productive of misery in the extreme, and union be ever so necessary to their happiness; that they must continue distinct for want of power to unite: in other words, that though the measure should be ever so expedient, the parliaments of the two countries are yet incompetent to enact it. It is a wretched argument, and such as no man in his senses can contend for. '*The bare idea of a state,*' says judge Blackstone, '*without a power somewhere vested to alter every part of its laws*, (and it is the laws of every country which make its constitution,) *is* the height of political absurdity." When men of the greatest knowledge and abilities have held such opposite opinions on this question, it would be presumptuous in the writer of this article to do more than record their opinions; but he may be permitted to inquire how it has happened that such difference could exist. It appears to him, that those who deny the competence, refer to some original compact or constitution, such as the National Convention established in France, from which there is no power of departing, without the consent of an assembly, chosen for this purpose; but where is such compact to be found? Was there ever a period when the government of England or of Ireland was to be set up anew, and when it was referred to any single person, or assembly or committee to frame a charter for the future government of the country, or when a constitution so prepared and digested, was by common consent received and established? The advocates of the competence of parliament, on the other hand, evidently consider the constitution to be founded on acts of parliament, on decisions of courts of law, and on immemorial usages. As therefore parliaments had united Wales and Scotland to England, and as the power of parliament to do whatever it deemed expedient had not been questioned in former times, they saw no solid objection to the competence of the independent parliaments of Great Britain and Ireland to form a junction for the common benefit. The constitution of England has grown out of occasion and emergency, from the fluctuating policy of different ages; from the contentions, successes, interests, and opportunities of different orders and parties of men in the community. There is no regular plan to be referred to, and therefore Paine said that we had no constitution. To return to the debate on Mr. Ponsonby's amendment, after seventy-three members had given their opinion for or against it, a division took place, and it was lost by a majority of one only. Encouraged by such a close division, the opposition used greater exertions; and when, two days after, the amendment was again moved on this report, it was carried by 109 to 104. This prevented the further direct discussion of the question during that session, the minister declaring it would not be again brought forward until its introduction should be justified by public sentiment. In the house of lords, several amendments were proposed, but the original address was carried by 52 to 17. In the minority was James, earl of Charlemont, a nobleman whose conduct was ever guided by what he deemed the interest of Ireland, and whom no selfish motives could swerve. The protest he signed on this occasion was one of the last acts of his public life, as he died on the 4th of August, 1799, before the measure could be again brought forward. As one of the arguments in favour of a union was the conduct of the Irish parliament during the king's illness, which might have led to two separate and distinct governments, Mr. Ponsonby brought in a bill to regulate the appointment of a regent, the discussions on which included the question of union. This bill went to enact that the regal power of the two kingdoms should reside in the same person, and that the regent of Ireland should be subject to the same restrictions as the regent of England, thus giving up the supremacy of the Irish legislature. The bill was opposed by lord Castlereagh, on the ground that it was incomplete, and that the danger of separation could not be cured by half-measures, and it was finally lost. In the committee on it, however, the speaker, Mr. Foster, had the first opportunity of delivering his sentiments against the union, which he availed himself of in a speech which was published, and which by its able details contributed very much to confirm members in their opposition to the measure. At the close of the session, the lord lieutenant again introduced the subject; and, after noticing the joint address of the two houses of parliament of Great Britain, recommending a complete and entire union between Great Britain and Ireland, said, "that his majesty, as the common father of his people, must look forward with earnest anxiety to the moment when, in conformity to the sentiments, wishes, and real interests of his subjects in Great Britain and Ireland, they may all be inseparably united in the full enjoyment of the blessings of a free constitution, in the support of the honour and dignity of his majesty's crown, and in the preservation and advancement of the welfare and prosperity of the whole British empire."

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The proceedings in the parliament of Great Britain will now demand our attention. On the 22d of January, 1799, the same day on which it was brought before the Irish parliament, a message from the king was delivered to the house of lords, by lord Grenville, one of the secretaries of state, and to the house of commons by Mr. Dundas, the other secretary, recommending it to both houses to consider of the most effectual means of finally defeating the design of separating Ireland from England, and of settling such a complete and final adjustment as would best tend to improve and perpetuate a connection essential for their common security, and to consolidate the strength, power, and resources of the British empire. In the lords, an address expressing a readiness to concur in any measure which might be found necessary or expedient towards the consolidation of the general interests of the British empire, was carried without opposition; but in the commons, a similar address was warmly opposed by Mr. Sheridan, who used arguments of the same nature as those of the Irish opposition. He particularly dwelt upon its being a breach of what he called the *final* arrangement in 1782, and it was much disputed, whether this had been intended to be final or not. General Fitzpatrick, who had been secretary to the duke of Portland, lord lieutenant at that time, as well as Mr. Grattan and others, maintained that it was so understood; whilst the duke of Portland himself and lord Yelverton asserted that further measures were in contemplation. It seems a matter of little consequence in what manner it was regarded at that time, but as the veracity of neither party can be called in question, it affords a striking proof of the difficulty of ascertaining the views by which public men are actuated. Mr. Sheridan moved an amendment, but it was feebly supported, and finally withdrawn. On the 31st of January, notwithstanding the amendment adverse to a union, which had been carried in Ireland, Mr. Pitt brought forward eight resolutions in a committee of the house, which were to form a ground-work for articles of union. He did not dispute the competence of the parliament of Ireland to accept or reject any proposition, but he had a right, as a member of the parliament of Great Britain, "to express the general nature and outline of the plan, which, in his estimation, would tend to insure the safety and the happiness of the two kingdoms." In the course of a very eloquent speech, Mr. Pitt said, "in answer to the question, what are the positive advantages that Ireland is to derive from a union, I might enumerate the general advantages which Ireland would derive from the effects of the arrangement, the protection which she will secure to herself in the hour of danger; the most effectual means of increasing her commerce, and improving her agriculture; the command of English capital; the infusion of English manners and English industry, necessarily tending to ameliorate her condition, to accelerate the progress of internal civilization, and to terminate those feuds and dissensions which now distract the country, and which she does not possess, within herself, the power either to controul or to extinguish. She would see the avenue to honours, to distinctions, and exalted situations in the general seat of empire, opened to all those whose abilities and talents enable them to indulge an honourable and laudable ambition. But, independent of all these advantages, I might also answer, that the question is not what Ireland is to gain, but what she is to preserve; not merely how she may best improve her situation, but how she is to avert a pressing and immediate danger. In this view, what she gains is the preservation of all those blessings arising from the British constitution, and which are inseparable from her connection with Great Britain."

The right honourable gentleman then proceeded to state, that a union would be the means of securing permanently to Ireland the great commercial advantages which she then held at the discretion of Great Britain, while it would open a more free and complete commercial intercourse; and intimated, that "if ever the overbearing power of prejudice and passion should produce that fatal consequence (separation), it would too late be perceived and acknowledged, that all the great commercial advantages which Ireland at present enjoys, and which are continually increasing, were to be ascribed to the liberal conduct, the fostering care, of the British empire, extended to the sister kingdom as to a part of ourselves, and not to any thing which had been done, or could be done, by the independent power of her own separate legislature." After enlarging upon some other points, and replying to some objections, he concluded with moving that the resolutions be referred to a committee of the whole house. Mr. Sheridan urged that, "under the present circumstances of the convulsed and disordered system of policy and general government of Ireland, it was not only impolitic, but even unsafe, to agitate the discussion of topics, the issues of which were to lay the most hardy and stout-hearted prostrate at the feet of a British minister." This indeed seemed to be the principal objection urged against the resolutions, that the discussion would tend to inflame Ireland, already in a state of considerable irritation. When the house divided on the question of the speaker's leaving the chair, the ayes were 140, the noes 15. On the 7th of February, the day fixed for considering the resolutions, Mr. Sheridan, after some prefatory remarks on the state of Ireland, in the course of which he asserted that all the advantages proposed might take place without a union, moved the following resolutions:

"That no measures could have a tendency to improve and perpetuate the ties of amity and connection, now existing between Great Britain and Ireland, which have not for their basis the manifest, fair, and free consent of the two countries. That whoever shall endeavour to obtain the appearance of such consent and approbation, in either country, by employing the influence of government for the purposes of corruption and intimidation, is an enemy to his majesty and the constitution."

In the latter resolution, Mr. Sheridan particularly alluded to the dismissal of the chancellor of the exchequer and prime serjeant, because they would not support the union; but Mr. Pitt maintained, that if many gentlemen were connected together with the fair intention of acting for the service of their country, it would be necessary, in order to preserve a unity of action, that they should agree in their system. The previous question was carried by 141 to 25. In the debate which followed on the motion for the speaker's leaving the chair, Mr. Grey (now earl Grey) urged, that the calamities of Ireland were not caused by the independence of her legislature, but had been in great measure owing to the conduct of government. "Look," said he, "at the history of Ireland, and you will find, that if it had not been for the interference of British councils, and of British intrigue, none, or but few of the evils which were felt would ever have taken place: evils of which government was the parent, and which were now made the reason for taking away all the semblance of liberty among the Irish people. All the feuds and religious animosities and dissensions which had distracted Ireland had been caused by government, and yet government was making use of these evils as a pretext for taking away the liberty of the people of Ireland." The motion was carried by 149 to 24; but from the lateness

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of the hour, the consideration of the resolutions was deferred. On the 11th of February another long debate took place, in which the topics chiefly discussed were, the conduct of the minister to the Catholics in 1795, and the settlement of 1782, which rendered it necessary to put off the main subject till the following day, on which the house went into a committee. The first resolution, stating the utility of uniting the two kingdoms, was opposed by Mr. (now sir B.) Hobhouse, and Mr. Bankes, and supported in a very able speech by the speaker (now lord viscount Sidmouth). The debate was not long, and all the resolutions were adopted without any division. On the 16th of February, on the question being put that the report be brought up, there was an animated debate, in which several members delivered their opinions, chiefly in favour of the measure: after which the resolutions were agreed to *seriatim*, and sent to the house of lords. The arguments used in that house were similar to those in the commons; the opposition was chiefly made by the earls Fitzwilliam and Moira, and lord Holland, but no division took place. Several able speeches were delivered in favour of a union, some of which, particularly those of lords Auckland and Minto, were printed separately, and circulated throughout Ireland. The marquis of Lansdowne, and the bishop of Llandaff (Dr. Watson), though not in the habit of supporting ministers, were favourable to the measure. On the resolutions being returned by the house of lords, with an address to his majesty, in which the concurrence of the commons was requested, Mr. Pitt moved that concurrence on the 22d of April, and after a debate, in which nothing was advanced, the address was agreed to.

The resolutions thus agreed to were, 1. "That in order to promote and secure the essential interests of Great Britain and Ireland, and to consolidate the strength, power, and resources of the British empire, it will be advisable to concur in such measures as may best tend to unite the two kingdoms of Great Britain and Ireland into one kingdom, in such manner, and on such terms and conditions, as may be established by acts of the respective parliaments of his majesty's said kingdoms. 2. That it would be fit to propose, as the first article, to serve as a basis of the said union, that the said kingdoms of Great Britain and Ireland shall, upon a day to be agreed upon, be united into one kingdom, by the name of *the United Kingdom of Great Britain and Ireland.* 3. That for the same purpose it would be fit to propose, that the succession to the monarchy and the imperial crown of the said united kingdom, shall continue limited and settled in the same manner as the imperial crown of the said kingdoms of Great Britain and Ireland now stands limited and settled, according to the existing laws, and to the terms of the union between England and Scotland. 4. That for the same purpose it would be fit to propose, that the said united kingdom be represented in one and the same parliament, to be styled *the Parliament of the United Kingdom of Great Britain and Ireland;* and that such a number of lords, spiritual and temporal, and such a number of members of the house of commons, as shall be hereafter agreed upon by acts of the respective parliaments as aforesaid, shall sit and vote in the said parliament on the part of Ireland, and shall be summoned, chosen, and returned, in such manner as shall be fixed by an act of parliament of Ireland previous to the said union; and that every member hereafter to sit and vote in the said parliament of the united kingdom shall, until the said parliament shall otherwise provide, take and subscribe the same oaths, and make the same declarations, as are by law required to be taken, subscribed, and made by the members of the parliaments of Great Britain and Ireland. 5. That for the same purpose it would be fit to propose, that the churches of that part of Great Britain called England, and of that part of Great Britain called Scotland, and of Ireland, and the doctrine, worship, discipline, and government thereof, shall be preserved as now by law established. 6. That for the same purpose it would be fit to propose, that his majesty's subjects in Ireland shall at all times hereafter be entitled to the same privileges, and be on the same footing in respect of trade and navigation in all ports and places belonging to Great Britain, and in all cases with respect to which treaties shall be made by his majesty, his heirs and successors, with any foreign power, as his majesty's subjects in Great Britain; that no duty shall be imposed on the import or export between Great Britain and Ireland, of any articles now duty free; and that on other articles there shall be established, for a time to be limited, such a moderate rate of equal duties, as shall, previous to the union, be agreed upon and approved by the respective parliaments, subject, after the expiration of such limited time, to be diminished equally with respect to both kingdoms, but in no case to be increased; that all articles which may at any time hereafter be imported into Great Britain from foreign parts, shall be importable through either kingdom into the other, subject to the like duties and regulations, as if the same were imported directly from foreign parts: that where any articles, the growth, produce, or manufacture of either kingdom, are subject to any internal duty in one kingdom, such countervailing duties (over and above any duties on import, to be fixed as aforesaid) shall be imposed as shall be necessary, to prevent any inequality in that respect. And that all other matters of trade and commerce, other than the foregoing, and than such others as may before the union be specially agreed upon for the due encouragement of the agriculture and manufactures of the respective kingdoms, shall remain to be regulated from time to time by the united parliament. 7. That for the same purpose it would be fit to propose, that the charge arising from the payment of the interest or sinking fund for the reduction of the principal of the debt incurred in either kingdom before the union, shall continue to be separately defrayed by Great Britain and Ireland respectively. That for a number of years to be limited, the future expences of the united kingdom, in peace or war, shall be defrayed by Great Britain and Ireland jointly, according to such proportions as shall be established by the respective parliaments previous to the union; and that after the expiration of the time to be so limited, the mode of jointly defraying such expences shall be regulated according to such rules and principles as shall be in like manner agreed upon previous to the union, for the purpose of establishing gradually an uniform system of taxation through every part of the united kingdom. 8. That for the same purpose it would be fit to propose, that all laws in force at the time of the union, and all the courts of civil or ecclesiastical jurisdiction within the respective kingdoms, shall remain as now by law established within the same, subject only to such alterations or regulations, from time to time, as circumstances may appear to the parliament of the united kingdom to require."

Such were the resolutions submitted by the lords and commons of Great Britain to the king, as best calculated to form the basis of a union, and which were afterwards laid before the Irish parliament. The sixth and seventh propositions contain much matter for discussion, in settling the duties and proportions; but the general outline appears to be founded on equal and liberal principles. The next object was to secure such a majority in the Irish house of commons, and such declarations in favour of it, as would enable the Irish

government

government to bring it before parliament in the ensuing session. During the summer of 1799, the lord lieutenant visited many parts of Ireland, with a view to conciliate jarring interests, and was received with great marks of respect.

This nobleman had, by his conciliating humanity, engaged the affections, and by his exalted virtues and great military talents, had attracted the esteem and the confidence of the nation. He was therefore peculiarly qualified for such a purpose. Addresses were presented to him by public bodies, wherever he directed his course, most of which expressed or implied approbation of a union, and the papers were crowded with declarations in favour of that measure, signed by the principal landed proprietors. The secretary, lord Castlereagh, also, was not idle; several who had been adverse to the union were induced either to change their opinion, or to resign their seats; and it was generally supposed that the minister would not be again in a minority. Much has been said of the corruption used on this occasion; it has been charged repeatedly in parliament, and but faintly denied, yet charges of this kind are not easily established. This is certain, that either from gratitude for their support, or by a previous arrangement, the relatives of many gentlemen who voted for this measure were promoted in various ways; and that for years after, what were called *union engagements* obstructed almost any other preferment at the bar, in the church, or in the revenue and state offices. Some have vindicated this as necessary to the attainment of a great benefit, but the true patriot will never admit that a good end will justify dishonest means; and whatever posterity may think of the measure itself, the impartial inquirer will be compelled to acknowledge that it had not the *unbiassed* support of a majority of the two houses of parliament, and that it was regarded with abhorrence by the great body of the people. At the same time, no exertions were spared by the opposers of the measure; seats were vacated to bring in active combatants; money was said to be subscribed to purchase boroughs; and other means, perhaps not strictly constitutional, were resorted to. Forty-eight members were brought in by one side or the other, in place of gentlemen who retired, and eight or nine were re-elected, on being appointed to lucrative places under the crown.

On the 15th of January, 1800, the lord lieutenant opened the session, by a speech from the throne, in which no mention was made of the union, and of course it was unnoticed in the address proposed by the friends of administration; but Mr. Ponsonby, having required the speech of the lord lieutenant at the close of the last session, in which he noticed the proceedings of the British parliament, to be read, moved as an amendment to the address, "humbly to assure his majesty, that this kingdom is inseparably united with Great Britain, and that it is the sentiments, wishes, and real interests of all his majesty's subjects, that it ever shall continue so united, in the full enjoyment of the blessings of a free constitution, in the support of the honour and dignity of his majesty's crown, and in the preservation and advancement of the welfare and prosperity of the whole empire, which blessings of a free constitution we owe to the spirited assertion of this kingdom of its birth-right to a free and independent parliament resident within it, and to the parental kindness of your majesty, and the liberality of the British parliament, ratifying the same in the year 1782, and which we have at all times felt, and do now particularly feel it our bounden duty to maintain." Ninety-six members voted for this amendment, and one hundred and thirty-eight against it, so that the minister had a majority of *forty-two*, on that question, on which, in the preceding session, there was a majority of *five* against him. On the 5th of February, after a number of petitions against the union had been laid on the table, the business was formally introduced by a message from the lord lieutenant, in which his excellency stated that he had it in command from his majesty to lay before both houses of legislature the resolutions of the British parliament, and to recommend to their consideration the great objects they embrace.

A long and spirited debate took place, in consequence of which the house did not adjourn till half past twelve on the following day, when a motion for referring the lord lieutenant's message to a committee was carried by a majority of 43; the ayes, including the tellers, being 158, and the noes 117; so that, reckoning the speaker, 276 members were present at the division. The great abilities of Mr. Grattan, which had been voluntarily cast into obscurity, by his retiring from parliament, were once more brought before the public on this interesting occasion. Mr. Saurin and Mr. Bushe, who now fill the important situations of attorney and solicitor general, also distinguished themselves in opposition to the measure, in addition to the gentlemen who spoke in the preceding session; so that lord Castlereagh, with very inadequate support, had to withstand a combination of men of talents, such as have seldom co-operated on any other occasion. It seemed as if in this last struggle for independence, Ireland had united all her powers of eloquence, sarcasm, and invective, to resist her supposed enemies. In a debate which took place in the committee of the whole house, on the first article of the union, Mr. Grattan opposed the measure with such a degree of vehemence, that the chancellor of the exchequer (Mr. Isaac Corry) accused him of associating with traitors, and of disaffection to the government. The reply of Mr. Grattan to this harsh and unwarrantable charge was so pointed and severe, that Mr. Corry conceived himself under a necessity of resenting it by a challenge. A meeting ensued, and Mr. Corry was wounded. The question, however, was carried by a majority of 161 against 115; and as the discussion proceeded, the numbers of opposition appeared to diminish. There was, however, no relaxation of the energy with which the union was opposed. The table of the house was crowded with petitions, the debates were frequently protracted through the whole night, and the minister was harassed by frequent divisions. On the 13th of March, before the committee had gone through the resolutions, sir John Parnell moved, "That an humble address be presented to his majesty, praying that he will be graciously pleased to dissolve the present parliament, and call a new one, before any final measure shall be concluded respecting a legislative union between Great Britain and Ireland." This motion was, of course, supported by all the force of the anti-unionists; but on the division it was lost by a majority of 46. A similar division, after a very long debate, took place on the question for receiving the report of the committee, which was delivered on the 21st of March, and being agreed to by the house, was sent to the lords for their concurrence. On the 27th of March, the resolutions were returned with some amendments, the leading articles having been carried in the upper house by a majority of 75 to 26. On the 2d of April, the resolutions, as they finally passed the Irish parliament, were laid before the British house, in which, though there were several spirited debates, the measure was carried by a great majority. In the lords, the principle was carried by 82 to 3, and the final division was 75 for and 7 against. In the commons, a motion of Mr. Grey's for an address to his majesty, "That he would be

be graciously pleased to suspend all proceedings on the Irish union till the sentiments of the Irish people respecting that measure could be ascertained;" was rejected by 236 to 30. The bill founded on these resolutions received the royal assent in England on the 2d of July, and in Ireland on the 1st of August, when the lord lieutenant, on proroguing parliament, congratulated it on the accomplishment of this great work.

As the general outline of the measure, already stated in the resolutions of the British parliament, was not departed from, and as much of the detail must be uninteresting, it will be sufficient here briefly to state the articles, enlarging only on those points which have not been before noticed. The first article was, That the two kingdoms should be united for ever from 1st Jan. 1801; the second, That the succession to the crown should continue as at present; the third, That the united kingdom should be represented in one parliament; the fourth, That four lords spiritual, by rotation of sessions, and twenty-eight lords temporal, elected for life by the peers of Ireland, should sit in the house of lords of the parliament of the united kingdom; and that one hundred commoners (two for each county of Ireland, two for the city of Dublin, two for the city of Cork, one for the university of Dublin, and one for each of the thirty-one most considerable cities, towns, and boroughs,) should be the number to sit and vote on the part of Ireland in the house of commons of the united kingdom. Under the fourth article were contained provisions, that the Representation Act of the Irish parliament should form part of the treaty of union; that the rotation and election of the lords spiritual and temporal should be according to a form prescribed; that Irish peers, who are not elected to serve as peers, may serve as British commoners, during which time they are not to have any privilege of peerage; that the crown may create new Irish peers on the extinction of others, under certain regulations, so that *one hundred* may be kept up over and above those entitled to an hereditary seat in the house of lords of the united kingdom; that peerages in abeyance shall be considered as existing peerages; that questions touching the election of Irish commoners shall be decided in the same manner as those touching English ones, subject to such particular regulations as local circumstances may require, and the united parliament deem expedient; that qualifications as to property shall be the same in both parts of the united kingdom; that the king may constitute the lords and commons of the present parliament of Great Britain, members of the respective houses of the first parliament of the united kingdom, on the part of Great Britain, to sit with those returned for Ireland; that no more than twenty Irish commoners holding places shall sit in the united parliament; that the lords of parliament on the part of Ireland, shall have the same privileges as those of Great Britain, and take precedency next to those of the same rank; and that the peers of Ireland, not representatives, shall have all privileges of peerage, except the right and privilege of sitting in the house of lords, and on the trial of peers. The fifth article provided for the union of the churches of England and Ireland, so that the preservation of the said united church should be deemed an essential and fundamental part of the union. By the sixth article, his majesty's subjects of Great Britain and Ireland are from the 1st of January, 1801, entitled to the same privileges, and are to be on the same footing as to encouragements and bounties on the like articles, and in respect of trade and navigation in all places in the united kingdom and its dependencies; there is to be no duty or bounty on exportation of the produce of one country to the other; but there shall be countervailing duties on several articles enumerated, some for twenty years only, and others as the united parliament may direct, but never to exceed those paid at the time of the union. By the seventh article, the charges for debts incurred by either kingdom before the union shall be separately defrayed; for twenty years the contribution towards the expenditure of Great Britain and Ireland shall be as fifteen to two, after which the expenditure shall be defrayed in such proportion as the parliament of the united kingdom shall deem just and reasonable, according to a system detailed in the article; the revenues of Ireland shall be a consolidated fund, which shall be charged in the first instance with the interest of the debt of Ireland, and with the sinking fund applicable to the reduction of the said debt, and the remainder shall be applied towards defraying the proportion of the expenditure of the united kingdom to which Ireland may be liable in each year. Under this head it is provided, that no article shall be more highly taxed in Ireland than in England; that any surplus of the revenues of Ireland shall be applied to the peculiar benefit of that country; that all monies raised after the union shall be a joint debt; and that premiums for the internal encouragement of agriculture or manufactures, or for maintaining institutions for pious and charitable purposes, shall be continued for twenty years in Ireland. By the eighth article, all civil and ecclesiastical laws and courts shall remain as established at the time, subject to future alterations; all writs of error and appeals shall be decided by the lords of the united kingdom; and there shall be a court of admiralty in Ireland, with an appeal to the court of chancery in Ireland. Such were the provisions of the Act of Union, as it was finally passed. We shall now add an address moved in the house of commons of Ireland on the 6th of June 1800, the purpose of which was to record the objections to this measure on the journals of parliament. When we consider the great abilities of the members who drew up and supported it, a Grattan, a Foster, a Ponsonby, a Plunket, and many others of distinguished talents, we may suppose that every thing has been urged which ingenuity could devise, or an acquaintance with the affairs and interests of Ireland could suggest; and, therefore, it should be read by every person wishing to form an opinion on the subject. It was moved that the following address be presented to his majesty.

"We, your majesty's loyal and dutiful subjects, the commons of Ireland, at all times sensible of the numerous and essential advantages which we, in common with your subjects in Ireland, have derived under your auspicious reign, beg leave to assure you, that none have more impressed the hearts of your majesty's subjects, than the adjustment, at your majesty's gracious recommendation, entered into by the parliaments of Great Britain and Ireland in 1782, thereby forming the most solemn compact which can subsist between two countries under a common sovereign; that the result of that compact was the increase of our trade and of our revenue, together with the harmony of the two parliaments, and the support of the connection; that the said compact on the part of your majesty's parliament of Ireland has been religiously and beneficially adhered to, insomuch that a final termination of all constitutional questions between the two nations took place, and the commercial points which at that time remained to be settled, have since, without agitation or ferment, been gradually and satisfactorily disposed of.

"That under these circumstances, it is with the deepest concern and the greatest surprise we have seen a measure propounded, under the name of Union, to set aside this most

most important and sacred covenant, to deprive this country of her parliament in time to come, and in lieu thereof to introduce an innovation, consisting of a separate Irish government without an Irish parliament, whose power is to be transferred to a British parliament without an availing Irish representation therein, an innovation such as may impair and corrupt the constitution of Britain, without preserving the liberties of Ireland, so that this country shall be in time to come taxed without being duly represented, and legislated for by a body out of the realm, incapable of applying proper remedies, and remote from the means of knowing her wants, her wishes, and her interests.

"That giving the name of Union to the measure is a delusion; the two kingdoms are already united to each other in one common empire, one in unity of interest, and unity of constitution, as has been emphatically pronounced from the throne by your majesty's former viceroy; bound together by law, and, what is more effectual than law, by mutual interest, mutual affection, and mutual duty, to promote the common prosperity of the empire, and it is our glory and our happiness that we form an inseparable part of it.

"That this union has stood the test of ages, unbroken by the many foreign wars, civil commotions, and rebellions which have assailed it; and we dread the rash and desperate innovation which now would wantonly and unnecessarily put it to the hazard, an innovation which does not affect to strengthen the unalterable interest of each country in supporting the revolution that placed your majesty's illustrious family on the throne, for that interest cannot be increased by any law; it is implanted in our hearts, it is interwoven with our prosperity, it grows with our growth, and strengthens with our strength.

"Neither does it profess to create an interest in either country to preserve their connection together, because that interest already exists, and we know and feel that such connection includes all that is dear to us, and is essential to the common happiness, and to the existence of both nations. We therefore do, with all humility, implore your majesty's protection of that glorious revolution, and of that essential connection against the perseverance of your majesty's ministers in their endeavours to force this ruinous measure.

"Their avowed object is a union of the two nations, but the only union they attempt is a union of the two parliaments, and the articles which are to attend their partial and defective union are all so many enumerations of existing distinct interests in the two kingdoms, which it cannot identify, and which require separate parliaments resident in each duly to attend to them. In respect to taxes, the purse of each nation is vested in its own house of commons by the principles of the constitution; the security of our liberty, and the great constitutional balance of the powers of the state, lie in its being left there; but the articles acknowledge a separate purse, and a separate interest in that purse, by providing for a separate proportion of expence, separate modes and laws of taxation, separate debts, separate sinking funds, separate treasury, separate exchequer, separate accounts of revenue to be kept, and separate articles of produce to be placed in the way of debtor and creditor between the two kingdoms, as between two unconnected parties; and though they state, acknowledge, and attempt to form regulations for all these many distinct interests, which no laws can identify or consolidate; and though even the legal interest of money remains different in the two kingdoms without their attempting to assimilate it, yet they take away the Irish parliament, which these distinctnesses ought rather to have suggested the creation of, if it did not exist, and they lay the foundation of distress, discontent, and jealousies in this kingdom, if not of worse evils, and tend to familiarize ideas of separation instead of union, to the utter ruin of this your ancient kingdom, and your loyal subjects therein.

"In regard to manufactures, they acknowledge the interests in them to be so distinct, that they are forced to provide in express terms against a free intercourse being allowed between the two kingdoms, in more than twenty general denominations, and they establish countervailing duties on the mutual import of at least twenty-four species of goods, on account of the necessary difference in taxation, and the distinctness of revenue, which, from the separate interests of the two kingdoms in them, will not admit of consolidation.

"On the mutual interchange of corn, that great necessary of life, they not only continue duties, but they provide for retaining prohibitions and bounties, and instead of even alleging an identity of interest in so important and general an article, they avow such separate interests to exist in it as law cannot remove; and an interdict is necessary to be laid on its free communication between the two kingdoms, which your majesty's ministers have at the same time the hardiness to tell us, their project is to unite, identify, and consolidate, throughout all their interests.

"We see with them that these interests are distinct, and we, therefore, raise up our voices to your majesty against their impracticable attempt to consolidate them; an attempt which they themselves acknowledge to be so, by their many provisions, all intended to secure a continuance of their distinctness.

"But however separate these interests are in taxes, in revenue, in trade, and in manufactures; and however incapable of being identified, we have the happiness of knowing that in the great point of constitution no difference exists: both nations have a full right to all the blessings of the British constitution; and we have an identity, not a distinctness of interest, in the possession of it. Yet such is the strange passion of your majesty's ministers for innovation, that not finding any such distinctness, they do by these articles create several highly alarming to us, and to all your majesty's subjects of this kingdom, who claim an equal right with Great Britain in the full and free enjoyment of that constitution. All the Irish temporal lords, except twenty-eight, are to be incapacitated by this measure from exercising their rights and duties as peers and hereditary counsellors, while every British temporal lord is to retain his full functions. Four spiritual lords only are to have a share in the legislature, while all the British spiritual lords are to continue theirs; and two-thirds of the Irish commoners are to be disqualified, while every British commoner remains. The articles further declare, that all Irish peerages shall be considered as peerages of the united kingdom, whereby the Irish peers, who are to be incapacitated from legislating as peers, are to continue peers, and may legislate as commoners, against every known principle and established practice of the constitution: nay, even when chosen commoners, they are not to represent any place in Ireland, the country from which they derive their honours, although their voices as commoners will extend equally with that of every other commoner to all the concerns of this kingdom; and thus the Irish purse will be eventually put into the hands of the Irish peerage, in direct defiance of a great and fundamental principle of the constitution.

"All these degrading, dangerous, and unconstitutional distinctions are not only created in the Irish peerage, but are to remain for ever, without power of alteration, by a provision being made in the articles for a constant creation of peers

peers for Ireland. That the Irish peerage is to be kept for ever a distinct body from the British, though the project professes a union of the two kingdoms of Britain and Ireland, and attempts a union of the two parliaments, of which the peerage is a constituent part; and this continuance of a separate Irish peerage, stripped as it will be of all parliamentary function, perpetuates a distinction insulting and degrading to this kingdom, which our ministers, if they had solely in view, without any regard to influence, a lasting union of the parliaments, to which this continuance no way contributes, would have avoided, by providing that the Irish peers, when reduced to the proposed number of twenty-eight, should be declared peers of the united empire equally with the British; and thus would have dissolved all national distinctions between them for the time to come.

"But it is not in trade, revenue, and manufactures only that distinct interests are declared to exist, nor in constitution alone that separate interests are to be created; the same distinctness is to be preserved in the administration of justice: every difference of law, every variation of practice and of regulation which now prevails, is to be allowed to distinguish the civil and ecclesiastical courts, with this one exception only, that, in the ultimate appeal, every Irish suitor is to be again at the expence and hazard of going to Westminster, instead of having a court in Dublin to resort to.

"We enlarge the more on these several enumerations of separate interests, avowed or created by your majesty's ministers, because the many provisions they propose for their future regulation are so many acknowledgments that no force of law can identify them, so as to admit of their consolidation; provisions all in themselves presumptuous and insufficient, inasmuch as it is not in the power of human wisdom to foresee the events of time, and provide now, by a system declared immutable, for the varying changes which must naturally take place in the lapse of years.

"Under the same conviction, though they profess a union of the two parliaments, they do not attempt to form out of them one with equal and common powers for both kingdoms: it is to be free in all its functions in respect to Britain, but shackled and bound up by restrictions as to Ireland. In this they deprive your majesty's Irish subjects of a parliament, such only as the British constitution acknowledges, free in its deliberations for every part of the empire it is to legislate for; such as we have a right to enjoy, equally unrestrained in its powers, and unfettered in its proceedings, as to the interests of this your majesty's kingdom; and such a one, free and independent in all its functions, as we solemnly claimed to be our birth-right in 1782, and as your majesty, in your wisdom and justice, did then graciously confirm to this kingdom for ever; but which claim and gracious confirmation your ministers now seek to take away from the kingdom for ever.

"That having thus shewn to your majesty how very inefficient the project of your ministers is to answer even the purpose it avows, and how very ruinous its operation must be, if you shall not be graciously pleased to interfere, we feel it our further duty to expose fully to your majesty's view, not only the artful delusions which those ministers have presumed to hold out of supposed advantages in commerce, in revenue, in taxes, and in manufactures, to deceive the people into an approbation of their scheme, but the corrupt and unconstitutional means which they have used, the undue manner in which they have employed the influence of the crown, and the misrepresentations which they have made of the sense of your majesty's people of Ireland on the measure. Were all the advantages, which without any foundation they have declared that this measure offers, to be its instant and immediate consequence, we do not hesitate to say expressly, that we could not harbour the thought of accepting them in exchange for our parliament, or that we could or would barter our freedom for commerce, or our constitution for revenue. But the offers are mere impositions; and we state with the firmest confidence, that in commerce or trade their measure confers no one advantage, nor can it confer any: for by your majesty's gracious and paternal attention to this your ancient realm of Ireland, every restriction under which its commerce laboured has been removed during your majesty's auspicious reign, and we are now as free to trade to all the world as Britain is.

"In manufactures, any attempt it makes to offer any benefit which we do not now enjoy is vain and delusive; and wherever it is to have effect, that effect will be to our injury. Most of the duties on import, which operate as protections to our manufactures, are under its provisions, either to be removed or reduced immediately; and those which will be reduced are to cease entirely at a limited time; though many of our manufactures owe their existence to the protection of those duties, and though it is not in the power of human wisdom to foresee any precise time when they may be able to thrive without them.

"Your majesty's faithful commons feel more than an ordinary interest in laying this fact before you, because they have, under your majesty's approbation, raised up and nursed many of those manufactures; and by so doing, have encouraged much capital to be vested in them, the proprietors of which are now to be left unprotected, and to be deprived of the parliament on whose faith they embarked themselves, their families, and properties, in the undertaking.

"In revenue we shall not only lose the amount of the duties which are thus to be removed or lowered, and which the papers, laid before us by the lord lieutenant, shew to amount to the immediate annual sum of 50,000*l*., but we shall be deprived of nearly as much more by the annihilation of various export duties, which have subsisted for above a century on other articles of intercourse, without being felt or complained of by us; and this whole revenue of 50,000*l*., which operated beneficially to our manufacture, and of near 50,000*l*. more, which oppressed no manufacture, is to be wantonly given up, without the desire or wish of either nation, at a time when our income is more than ever unequal to our expences, and when the difficulty of raising new taxes to supply its place is alarmingly increased, by our having been obliged, in this very session, to impose new burthens to the estimated amount of 300,000*l*. a year; and we cannot but remark, that in this arrangement, while we give up this revenue of near 100,000*l*. a year, Great Britain is to give up one not amounting quite to 40,000*l*.; an inequality no way consonant with the impartiality or justice professed by your majesty's ministers, nor any wise consistent with the comparative abilities of the two countries to replace the loss.

"But the imposition of your majesty's ministers is still more glaring, in their having presumed to fix a proportion of contribution towards the general future expences, to be observed by the two kingdoms, in the ratio of one part by Ireland for every seven parts and a half by Britain. If they had any plausible grounds whereon they calculated this proportion, they have not deigned to lay them before your parliament; and the usual and established forms of committees, to investigate into matters of such intricate and extended calculation, have been superseded by them. Your majesty's faithful commons are satisfied that the calculation is extremely erroneous, and that, on a just and fair

inquiry

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inquiry into the comparative means of each country, this kingdom ought not and is not able to contribute in any thing like that proportion. They feel it a duty, too, to protest most solemnly against any arrangement of taxation, on which they have had no documents, or made any inquiry to guide their judgment, and in which they understand no consideration whatever has been had to the different legal interest of money in this kingdom, which causes a disadvantage of 20*l. per cent.* in procuring capital, nor to the relative quantity of shipping possessed and used by each country, nor to the export trade in foreign articles, nor to the extent of manufacture for home consumption, nor to the balance of trade, which shews the annual increase of its clear profit, and of course the annual increase of the fund it creates to contribute from; in all of which, the means of Britain very far exceed the foregoing proportion, and particularly in the balance of trade, which in Ireland amounts to little more than half a million with all the world, but is stated by authority to have amounted to fourteen millions eight hundred thousand pounds in Britain, exclusive of an annual influx of money from the East and West Indies to the amount of four millions to the proprietors resident in Britain, and of two millions from Ireland to the proprietors of Irish estates resident there, and of another million from Ireland for the charges of her debt due in Britain; whereas the only known or visible influx of money into Ireland is the above balance of trade of half a million only: and these two sums of two millions and one million, while they add to the means and wealth of Britain, unfortunately take away in the same amount from the ability of Ireland.

"Thus, had a due investigation been made, and a fair inquiry gone into, with a view to obtain a true knowledge of facts whereon to ground a just calculation, it would have appeared that this proportion for Ireland is not only unjust, but far beyond what it will be in her power to discharge; and the rashness of your majesty's ministers, in hazarding such a measure, is the more to be lamented or wondered at, because should Ireland engage to pay more than she is able to answer, the necessary consequence must be a rapid decrease of her capital, the decline of her trade, a failure in the produce of her taxes, and, in the end, her total bankruptcy. But under such circumstances, she cannot be alone a bankrupt; and should she fatally become so, by an injudicious or avaricious apportionment of constitution, Great Britain must share in her ruin, and our great and glorious empire be brought to the brink of destruction, by an innovating attempt to take from Ireland its constitution, and substitute a theoretic, visionary, and untried system in its room. We should, therefore, earnestly supplicate your majesty to oblige your ministers to defer the measure, until a full and satisfactory investigation should be made, if we did not feel that it ought to be entirely relinquished, and that the injuries and dangers attending on it could not be removed by any change of that proportion, or reconciled by any modification of detail whatsoever. Subordinate, however, as the consideration of it is, we cannot omit remarking to your majesty, that there is cunningly and insidiously annexed to it a provision for its ceasing, even within the short period of three years, should the war continue so long; and that when we shall increase our debt, so as that it shall bear the like proportion to the permanent debt of Britain, all the delusive benefit held out by this proportion is to cease, and we are to undergo common taxes with Britain. We lament that such delusion should be resorted to; it is too palpable not to be seen; and instead of the confidence which ought to attend every arrangement between the kingdoms, such conduct must excite diffidence and distrust.

"This proportion of their respective permanent debts is to be attained by increasing our debt, which we must do, and by Britain lessening her's, which she is in the actual course of reducing, as rapidly at least as that of Ireland increases. The absurdity, therefore, of the position is self-evident; for it says, that Ireland by increasing her debt, and its annual charges, will become more wealthy, and more able to bear equal taxes with Britain; but that Britain, by decreasing her's, will be less able to defray her contribution, and can only pay equal taxes. Another delusion (omitted, however, in the articles proposed) has been also plausibly offered, still further to deceive your majesty's subjects of Ireland into an approbation of this destructive measure, and a promise has been authoritatively announced or artfully insinuated by your ministers in this kingdom, that Ireland is to save by it, or that Great Britain is to give her a million a year of revenue in time of war, and half a million a year in time of peace. But we know that during a war like the present, such a promise is impracticable; and both kingdoms must strain every nerve, and draw forth every resource. We seek not to load our sister kingdom unnecessarily, by lessening our own burden; and our loyalty forbids us to listen to arguments, which offer to save our purse at the expence of Britain. But it is all a delusion, for we see nothing in the uniting of the two parliaments, which can change the course of the war, or lessen the total mass of expence of both nations; and we assert most confidently, that no gift can be made, or saving ensue in our expences, by the union, however they may be attempted to be increased by the unfounded and unfair proportion ascertained for us to bear of the general expenditure. But were the offer founded, were it effectual and desirable, its advantages rest on the misfortunes of war; and we should feel ourselves unworthy of the trust reposed in us, if we could suffer a hope, arising from the continuation of such a dreadful calamity, to direct our conduct in any measure, much less in one which calls on us to give up our constitution for ever.

"Neither can we look forward to any proposed saving from the union in peace; for we are not told, nor could we believe it, if your majesty's ministers did tell us, that a bill professing to unite the two kingdoms, inseparably united without a bill, can have an influence on the situation of the affairs of Europe, or that it can allow us, during the next peace, to dispense with keeping up the same military force as during the last; and we are further given to understand, that your majesty's royal court, and all its establishments, the courts of law, the exchequer, and all the revenue expences, are to be continued without the parliament equally as with it. But were the saving practicable, we feel it is our own duty to make it without a union; and we know that no parliament can do it for Ireland with the same knowledge, the same efficacy, and the same safety, as the resident parliament of Ireland.

"But it is not only in respect to these delusions held out as to trade and revenue, that we feel it our duty to lay before your majesty the conduct of your ministers on this measure: we must state the means by which they have endeavoured to carry it. That in the first instance, admitting the necessity of conforming to the sense of the parliament and the people, they took the sense of the commons, and found that sense to be against it; that they then affected to appeal against the parliament to the people, at the same time endeavouring by their choice of sheriffs to obstruct the regular and constitutional mode whereby the sense of the people has been usually collected: that, on the contrary, they did use or abet and encourage the using of various arts and stratagems to procure from individuals of the lowest order,

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order, ſome of whom were their priſoners and felons, ſcandalous ſignatures againſt the conſtitution: that, notwithſtanding theſe attempts to procure a fallacious appearance of ſtrength and muſter againſt parliament, the people have expreſſed their ſentiments decidedly againſt the union; and twenty-one counties at public meetings legally convened, and alſo many other counties by petitions ſigned by the freeholders, and many cities and towns, have expreſſed either to your majeſty, or to this houſe, or to both, their decided and unalterable hoſtility to this union; yet your miniſters have, as we believe, taken upon them to ſtate to your majeſty and your miniſters in Britain, in defiance of all theſe facts, that the ſenſe of the nation is not adverſe to the meaſure: that if there could be any doubt that your majeſty's miniſters in the appointment of ſheriffs did conſider how they might obſtruct the people in delivering their opinion regarding the union, that doubt is fully explained by their continuing in office the ſheriff of the former year in more than one inſtance, whence it alſo appears how decidedly the ſenſe of the country is againſt this meaſure, when your majeſty's miniſters found it difficult to procure any perſon to ſerve the office of ſheriff who was properly qualified, and was alſo a friend to the meaſure: that, finding the ſenſe of the people as well as the parliament to be againſt it, your majeſty's miniſters attempted to change the parliament itſelf, and refuſing to take the ſenſe of the nation by a general election, they procured a partial diſſolution, and did ſo publicly abuſe the diſqualifying clauſe in the place-bill (which was enacted for the expreſs purpoſe of preſerving the freedom and independence of parliament), that by vacating ſeats under its authority, very many new returns were made to this houſe for the purpoſe of carrying it; and thus did they change the parliament without reſorting to the people: that before the miniſtry had perverted the place-bill, the ſenſe of parliament was againſt their union; and if that bill had not been ſo perverted, that ſenſe had remained unaltered: that of thoſe who voted for the union, we beg leave to inform your majeſty, ſeventy-ſix had places or penſions under the crown, and others were under the immediate influence of conſtituents who held great offices under the crown: that the practices of influence above-mentioned, were accompanied by the removal from office of various ſervants of the crown who had ſeats in parliament, particularly the chancellor of the exchequer, the prime ſerjeant, three commiſſioners of the revenue, a commiſſioner of accounts, a commiſſioner of barracks, and the curſitor of the court of chancery, becauſe they would not vote away the parliament; alſo by their withdrawing their confidence from others of your majeſty's faithful and able counſellors for the ſame reaſon: that they procured or encouraged the purchaſe of ſeats in this houſe to return members to vote for the union; alſo the introduction of perſons unconnected with this country to vote away her parliament: that they have alſo attempted to proſtitute the peerage by promiſing to perſons, not even commoners in parliament, her ſacred honours, if they would come into this houſe and vote for the union: and that, finally, they have annexed to their plan of union an artful device, whereby a million and a half of money is to be given to private perſons poſſeſſing returns, who are to receive ſaid ſum on the event of the union, for the carrying of which to ſuch an amount ſaid perſons are to be paid; and this nation is to make good the ſale by which ſhe is thus diſinherited of her parliament, and is to be taxed for ever to raiſe the whole amount, although, if your miniſters ſhall perſevere in ſuch a flagrant, unconſtitutional ſcheme, and the money is to be raiſed, it is for the union, and being therefore an imperial concern, ought to be borne in the proportion already laid down for imperial expences, that is, two ſeventeenths by Ireland, and fifteen ſeventeenths by Britain: that under theſe unconſtitutional circumſtances your majeſty's miniſters have endeavoured, againſt the declared ſenſe of the people, to impoſe upon them a new conſtitution, ſubverting the old one.

"That when we conſider the peculiar ſituation of this kingdom, with the annual drains of money from it by perſons poſſeſſing property in it, who do not reſide, to the eſtimated amount of at leaſt two millions annually; when we advert to the further inevitable drain of a million a year by the public revenue, to be remitted to Britain for the annual charges of our public debt; and that to countervail theſe great and tremendous iſſues of money, amounting to three millions, we have only our general balance of trade, not 600,000*l.* a year, to ſet againſt them; we look with dread at a meaſure which muſt on the one hand neceſſarily add to thoſe drains, by adding a new and large portion of our wealthieſt fellow-ſubjects to the preſent abſentees, and which muſt on the other hand decreaſe that balance, by encouraging and promoting new imports of manufacture in the room of thoſe which will decline here. We look to it with the more dread, becauſe, notwithſtanding the great loans from England, to the amount of ſix millions in the laſt three years, we have not been able to counterbalance the exiſting drains from hence, and the exchange has been and ſtill continues regularly and uniformly againſt us. And further, becauſe our inability to raiſe the neceſſary loans within this kingdom, even to the ſmall extent that has been expected, is unfortunately now too evident; and the continuing to ſupply our treaſury by loans from Britain, though it may afford ſome temporary relief, will regularly increaſe the evil. Your majeſty's miniſters, therefore, if they promiſe to themſelves or to the Britiſh nation any eaſement to their own taxes, from the ſuppoſed acceſſion of power over our wealth and over our reſources, will find themſelves moſt thoroughly diſappointed; and if the difficulty of remittance ſhall increaſe, the manufacturers of Britain, who have hitherto ſupplied this kingdom, will find the demand for their goods decreaſe in proportion as that difficulty ſhall riſe.

"That we underſtand one benefit which they hold out from the propoſed meaſure is, what your miniſters affect to call tranquillizing Ireland; but that when we look to our parliament, and ſee with what efficacy and promptneſs it has contributed to put down the late unfortunate rebellion, how inadequate a parliament not reſident would have been; when we reflect that in a kingdom containing four and a half millions of people, a reſident parliament muſt poſſeſs the quick and authoritative means of giving energy to the executive, which a parliament in another country cannot have; that the removing of the parliament tends to remove with it from the kingdom thoſe men of large property and influence, of talents and reſpectability, whoſe preſence is at all times eſſential to tranquillity, and may at ſome conjuncture be alone capable of preſerving it; that their abſence will leave room for political agitators and men of talents, without principle or property, to diſturb and irritate the public mind; we tremble for the conſequences of a meaſure at once the moſt raſh and unneceſſary, that ever was brought forward by any miniſters, and at a time moſt fitted to produce every evil dreaded, and leaſt fitted to promote any one benefit held forth.

"That when we conſider the time choſen to introduce ſuch a meaſure, we feel additional repugnance, it being the moment of our weakneſs and diſtreſs, when the country is of courſe leſs free to deliver its full and heartfelt ſentiments againſt the illiberality of ſuch an attempt; peculiarly mortifying

tifying to those of your majesty's subjects who had recently exerted themselves in defence of that constitution which they are now called upon to surrender, and at a time too when the spirit of innovation is abroad, and likely to be much encouraged by the example of your majesty's ministers in this their proceeding against the ancient liberties of the people, who may be rendered an unprofitable or dangerous part of the British empire, whether in consequence of this union they become slavish and abject, or restless and dissatisfied.

"That when we reflect on the great value of the acts for trying controverted elections, how eminently and effectually they have been framed for preserving the purity of election, without which the purity of parliament cannot exist; and when we see that your ministers, well knowing the value we set on them, have proposed various means to continue those benefits to us in the few elections which will remain to be held here after the union, and have withdrawn them all from their inefficacy and insufficiency almost as soon as they were proposed, and have now abandoned all hope of framing any; we foresee and dread the formidable power which the measure of union will give to the minister in all Irish elections, by destroying the beneficial operation of these acts; for the expence, trouble, and delay of trying controverted Irish elections in London, will deter many candidates entitled to be returned from seeking redress; the sheriffs, who are all appointed by the minister, will in fact nominate the members, and many of them having already obeyed the wishes of the minister in endeavouring to stifle the constitutional voice of the people, give us too sure an omen of the conduct which may be expected from them in elections.

"That whether we rest on this incontrovertible and self-evident truth, that no parliament in another kingdom can have the local information or knowledge of the manners, habits, wants or wishes of the nation, which its own parliament naturally possesses, and which is necessary for beneficial legislation, nor can be supplied with the necessary information, either as promptly or accurately; or whether we look to the clear proofs of that truth which the progress of this measure has afforded, by your ministers having called to their assistance in London the great officers of this kingdom most likely from their station to give full information for framing their measure, and though all their talents and all their own information, and what they obtained by letters while it was pending, were employed for months there, yet when they brought it back, a few hours or rather a few minutes inquiry on the spot in Dublin, forced them to alter their project in very many articles, complete and perfect as they thought it; we have strong additional reason to feel and to represent the manifest and irreparable injuries which this kingdom must sustain by the want of a resident parliament, and the impossibility of legislation being carried on for it as it ought to be.

"Therefore, inasmuch as the measure of a union is an unnecessary innovation, and innovation at all times hazardous, and rendered peculiarly so now by the awful situation of the times; inasmuch too, as far from being an innocent experiment, it is replete with changes injurious to our trade and manufactures and our revenues; inasmuch also, as it destroys our constitution which has worked well, and substitutes a new one, the benefits of which we cannot see, but the numerous evils and dangers of which are apparent, and which in every change it offers militates against some known and established principle of the British constitution; inasmuch also, as it so far endangers the constitution of Britain, as not to leave us the certainty of enjoying a free constitution there when our own shall be destroyed; inasmuch as it tends to impoverish and subjugate Ireland, without giving wealth or strength to Britain; inasmuch as it tends to raise and perpetuate discontent and jealousies, to create new and strengthen old distinctnesses of interests in our concerns of trade, manufactures, revenue, and constitution; and instead of increasing the connection between the two kingdoms, may tend to their separation, to our consequent ruin, and to the destruction or dismemberment of the empire; inasmuch as it endangers instead of promoting or securing the tranquillity of Ireland, as it degrades the national pride and character, debases its rank from a kingdom to that of a dependant province, yet leaves us every expence and mark of a kingdom but the great essential one of a parliament; inasmuch as it has been proposed and hitherto carried against the decided and expressed sense of the people, notwithstanding the improper means resorted to, to prevent that sense being declared and to misrepresent it when known; inasmuch as it is not grounded in all its intricate and momentous parts on that solemn and full investigation which ought to attend every measure of great moment, and has been introduced and conducted with various delusions and impositions, and with an unbecoming and suspicious haste; inasmuch as it provides for sending one hundred of the present representatives to legislate in another kingdom, though elected only to sit in the parliament in this, and does not give the people an opportunity, by a new election, to exercise their discretion in a new choice of persons for such a new altered and increased trust; inasmuch as it leaves to the chance of drawing lots the choice of thirty-two members to represent as many great cities and towns with a levity which tends to turn into ridicule the sacred and serious trust of a representative; and while it commits to one person the office which the constitution commits to two, of speaking the voice of the people and granting their money, it does not allow the electors to choose which of the two they will intrust with that power; and inasmuch as means the most unconstitutional, influence the most undue, and bribes openly avowed, have been resorted to, to carry it against the known sense of the commons and people during the existence of martial law throughout the land;—we feel it our bounden duty to ourselves, our country, and our posterity, to lay this our most solemn protest and prayer before your majesty, that you will be graciously pleased to extend your paternal protection to your faithful and loyal subjects, and to save them from the danger threatened by your majesty's ministers in this their ruinous and destructive project, humbly declaring, with the most cordial and warm sincerity, that we are actuated therein by an irresistible sense of duty, by an unshaken loyalty to your majesty, by a veneration for the British name, by an ardent attachment to the British nation, with whom we have so often declared we will stand or fall, and by a determination to preserve for ever the connection between the two kingdoms on which the happiness, the power and the strength of each irrevocably and unalterably depend."

Such was the protest which the Irish parliamentary opposition had recorded on the journals of the house; a protest which deserves the attention of the political enquirer, as well on account of the objections it dwells upon, as on account of the weakness of some of its arguments, shewing how men of the first talents and information may be biassed by prejudice and passion. To this it will be useful to add an extract from a work already referred to, (Mr. Newenham's View of the Circumstances of Ireland,) a work which may be safely recommended, as containing much valuable statistical information respecting the country, being the production of a gentleman who spares no exertions to obtain the most authentic accounts, and whose honourable character places

places him far above the suspicion of wilful misrepresentation. Mr. Newenham was in parliament when the measure was brought forward and discussed, and from his connections had the best means of knowing the sentiments of many leading persons at that time. "Of those who supported the union," says he, "few appeared to be duly impressed with the real expediency of that measure; which consisted, rather in precluding all possible future collisions of supposed national interests, especially with regard to commercial matters; and in the admission of the Roman Catholics to an equal participation with the Protestants of all the political benefits of the constitution, without endangering the political power of the latter, or even affording them the smallest ground for apprehension, than in any other considerations. And yet that a legislative union of the two kingdoms, or some compact, involving a limited and occasional acquiescence of the legislature of one in the decisions of that of the other, was requisite to preclude the hostile effects which might very possibly result from those accidental collisions; and that an incorporation of the British and Irish legislatures was necessary to remove those groundless, but prevailing apprehensions which operated in excluding the Roman Catholics from parliament, and consequently had the effect of keeping them in a perpetual and dangerous state of discontent and irritation, were truths by which, it might reasonably have been expected, every unbiassed man, after due reflection, would be sufficiently governed. In opposing or supporting such a measure, a man who had the welfare of his country, and also that of the empire at heart, would naturally have been governed entirely by his perception of the benefit or inconvenience likely to accrue from the different articles proposed as constituent parts thereof. If these articles did not appear equally beneficial to both of the contracting countries; if they were not strictly suited to the respective circumstances of each; if they were not susceptible of such modifications as future variations of these circumstances might require; if they appeared calculated to create or continue dissatisfaction in either country; if they were not such as to ensure the permanence of the contract, the dissolution whereof might occasion much more extensive and serious mischiefs than those which the projectors of it aimed at precluding,—the duty of every true Irish patriot, and of every sincere advocate for the welfare of the empire, certainly required him to oppose it. On the contrary, if these articles were evidently calculated to diffuse future general satisfaction, by securing, under all changes and emergencies, an equitable participation of commercial and political benefits to the people of both countries, true patriotism unquestionably required the sacrifice of that ridiculous national pride which was to be outraged by a surrender of legislative independence.

"Instead of patiently and prudently discussing the proposed contract, with reference to its constituent stipulations, which positively was the only method by which its real eligibility could be ascertained, the Irish house of commons preposterously entered, in the first stage of the business, into violent and declamatory debates on the measure in the abstract; and suffered themselves to be governed more by national pride, individual interest, and speculative political notions, than by considerations of national benefit. The consequence of which was, that the minister, having a majority in favour of the measure in the abstract, found it eventually an easy matter to secure a sufficient concurrence in its several articles; for those who had been swayed to support it at large, and had pledged themselves to do so, would have been guilty of unusual tergiversation by resisting it in detail. Had the assent of parliament been suspended, until the different articles of the contract were thoroughly investigated, in all their bearings and effects; had each article been made the subject of a separate debate; it is not unreasonable to suppose that the union might have been rendered much more advantageous to Ireland; and, in the end, more beneficial to the empire. For, sooner than have his long meditated and indeed expedient project defeated, the minister of Britain would probably have conceded much to the desires of the Irish parliament, as he had before done to the British opposition, in the case of the commercial propositions. To the impatience and precipitancy therefore of the parliament of Ireland, which the minister ought, in prudence, rather to have restrained than encouraged, we must impute the defects of the act of union, and the probable future dissatisfaction of the Irish, consequent thereon." These defects, in Mr. Newenham's opinion, are, 1. That Ireland should have had some appropriate advantages in compensation for the loss of a local legislature. 2. That the commercial arrangement between the two countries ought to have been regulated by the consideration that much of the wealth acquired in Ireland would necessarily flow into Britain and remain there, while none of that acquired by the latter would finally be fixed in the former. 3. That Ireland should have had some indemnification for the increased pressure of taxes from the increase of absentees. 4. That there should have been the same protection to other manufactures as to the cotton manufacture. 5. That the Catholics should by an article of the union have acquired the right of sitting in parliament; and lastly, That the number of representatives was not as great as it ought, on fair principles, to have been. It is a melancholy fact that domestic tranquillity has not hitherto been produced by the union, but it would be unfair to attribute the continuance of disturbance to that measure, and it would be perhaps too soon to despair of those advantages resulting which many unbiassed men expected from it, and which in a great degree reconciled them to the objectionable manner in which it was carried. One effect it has produced; we see Irishmen filling the highest departments of the united kingdom; and we must allow that government has shewn a general disposition to promote the interests of Ireland. It is to be desired that English members may not be prevented by false delicacy or indifference, from taking a part in the internal regulations of Ireland, as it was a benefit which many looked for from the union, that it would take legislation out of the hands of an Irish party. On the whole, it may be said that the union might have been and still may be rendered extremely beneficial to Ireland, consistently with the welfare of Britain, but that hitherto it cannot be considered, even by its most sanguine advocates, as having afforded matter of congratulation to the people of Ireland. Journals of the Lords and Commons of Ireland. Various Pamphlets respecting the Union. Newenham's View of the Natural, Political, and Commercial Circumstances of Ireland. Annual Register. Wakefield's Account of Ireland, &c. &c.

Union, in the *Manege*, denotes the action by which a horse draws together and assembles the parts of his body, and his strength, in distributing it equally upon his fore-legs, and in reuniting and drawing them together; as we ourselves do when we are going to jump, or perform any other action which demands strength and agility. This posture alone is sufficient to settle and place the head of the animal, to lighten and render his shoulders and legs active, which, from the structure of his body, support and govern the greatest part of his weight. Being then, by these means, made steady, and his head well placed, you will perceive in every motion which he makes a surprising correspondence

respondence of the parts of the whole. The legs and shoulders of a horse support, as we have said, the greatest part of his weight; and, therefore, his fore-part, either when he is in motion, or in a state of rest, is always employed, and consequently needs the assistance of art to ease it; and in this consists the union or putting together, which, by setting the horse upon his haunches, counterbalances and relieves his fore-part. Besides, the union not only helps and relieves the part of the horse that is the weakest, but it is so necessary to every horse, that no horse that is disunited can go freely: he can neither leap nor gallop with agility and lightness, nor run without being in manifest danger of falling, and pitching himself headlong; because his motions have no harmony nor agreement with one another. The trot is very efficacious in bringing a horse to this union; *i. e.* the trot, in which he is supported and kept together, and yet suppled at the same time: this compels the horse to put himself together, and to collect and unite his strength. In order to support the horse in this trot, the horseman should hold his hand near his body, keeping his horse together a little, and having his legs near his sides. The effect of the hand is to confine and raise the fore-parts of the horse; the effect of the legs is to push and drive forward the hinder parts. Now, if the fore-parts are kept back or confined, and the hinder parts are driven forward, the horse, in a quick motion, such as the trot, must necessarily sit down upon his haunches, and unite and put himself together. For the same reason, the making of your horse to launch out vigorously in his trot, and the quickening of his cadence from time to time, the putting of him to make pesades, the stopping of him, and making him to go backward, will all contribute towards his acquiring the union. If your horse trots, press him a little; in the instant when he redoubles and quickens his action, moderate and shorten the hurry of his pace; and the more he presses to go forward, the more will his being checked and confined tend to unite his limbs, and the union will be owing to opposite causes; *viz.* on the one hand, to the ardour of the horse who presses to go forward, and to the diligence and attention of the horseman on the other, who, by holding him in, slackens the pace, and raises the fore-parts of the creature, and at the same time distributes his strength equally to all his limbs. The action of a horse, when going backward, is directly opposite to his abandoning himself upon his shoulders: by this he is compelled to put himself upon his haunches; and this lesson is so much the more effectual, as the cause of a horse's being disunited is often owing to the pain he feels in bending his haunches.

The pesades have not less effect, especially upon horses that are clumsy and heavy-shouldered; because they are thus taught to use them and raise them up; and when they raise them up, it necessarily follows, that their whole weight must be thrown upon their haunches. A light and gentle hand, then, and the aids of the legs, judiciously managed, are capable of giving a horse the union; but before a horse is put upon his haunches, his fore-part must be lightened, and he must acquire that suppleness, which is the source of light and free action. Nothing can supple the shoulder more than the working of a horse upon large circles; walk him first round the circle, in order to make him know his ground; afterwards try to draw his head in, or towards the centre, by means of your inner rein and inner leg: *e. gr.* I work my horse upon a circle; and I go to the right; I draw his head to the right, by pulling the right rein; I bring *in* his outward shoulder by means of the left rein; and I support him at the same time with my inner leg. Thus the horse has his head in the centre, although the croupe is at liberty. The right leg crosses over the left leg; and the right shoulder is suppled, while the left leg supports the whole weight of the horse in the action. In working him to the left hand, and following the same method, the left shoulder is suppled, and the right is pressed and confined. When this lesson, which tends not only to supple the shoulders, but likewise to give an appui, is well comprehended by the horse, let him be led along the side of the wall. Having placed his head, the horseman is to make use of the inner rein, which draws in his head, and to bring in his outward shoulder by means of the other rein. In this posture the horseman supports him with his inner leg, and he goes along the wall; his croupe being *out*, and at liberty, and his inner leg passing over and crossing his outward leg at every step he makes. By this his neck and shoulders are suppled, his haunches worked, and he is taught to know the heels. The haunches are thus worked, though the croupe of the horse is at liberty; because it is from the fore-parts only that a horse can be upon his haunches. In effect, after having placed his head, draw it *in*, and you will lengthen his croupe: if you raise him higher before than behind, his legs come under his belly, and consequently he bends his haunches. It is the same when he comes down hill, his croupe, being higher than his fore-parts, is pushed under him, and the horse is upon his haunches; since it is evident, that the hinder support all the fore-parts; therefore, in going along the side of the wall, by means of the inner rein, the horse is put together and united. When a horse has acquired union, he becomes able to undertake and execute, with justness and grace, whatever the horseman demands of him, conformably to his strength and disposition. Berenger's Art of Horsemanship, vol. ii. chap. 7.

Union *by the first Intention*, in *Surgery*, denotes the process by which the opposite surfaces of recent wounds grow together and unite without suppuration, when they are kept in contact with each other. It is observed by professor Thomson, that among the various powers inherent in living animals, there is none more interesting to the surgeon, nor more remarkable in the eyes of a philosophical observer, than that by which wounds are healed, or by which the different parts of animal bodies, that have been recently divided, either by accident or design, are made to reunite with each other. This is a power, the effects of which in the human body are so obvious and important, that it would not fail at a very early period to attract, in some degree, the attention of every observer of nature; and accordingly we find, from the records of medicine, that the various circumstances which promote, retard, or prevent the healing of wounds, have at all times been more or less known to the practitioners of the healing art. A very slight degree of observation, however, must soon have been sufficient to convince them, that the phenomena which the healing of wounds exhibits, are neither simple in their nature, nor uniform in the order of their appearance; but variable according to the kind of wound, and the mode of treatment, which, in the different external and internal conditions of the body, is employed for its cure.

In slight wounds, inflicted by the sharper kinds of instruments, says the same author, even the most inattentive medical practitioners must have seen, that a reunion is often speedily effected merely by keeping the edges of the wound in contact with each other; whereas in wounds in which the divided surfaces are much torn or bruised, or where, from retraction, or loss of substance, they cannot be brought into contact, the healing is always accomplished in a much slower, more uncertain, and more complicated manner. These diversities in the process of reunion (continues Dr. Thomson),

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are taken notice of by the earlieſt writers upon phyſic and ſurgery; and diſtinguiſhed from one another by different appellations or terms of art. Union by the firſt intention was the term which Galen employed to expreſs that mode of healing wounds, in which the union is ſpeedily produced merely by keeping their edges in contact: an operation of nature, now frequently denominated healing by the proceſs of adheſion; while union by the ſecond intention was a term employed by the ſame phyſician to indicate the ſeries of phenomena which occur in that ſlower mode of healing wounds, in which their edges coaleſce more ſlowly; phenomena to which modern ſurgeons now uſually give the name of healing by the proceſs of granulation. See Lectures on Inflammation, p. 206, 207.

We have alſo examples of an union, very ſimilar to that by the firſt intention, in bones which have been fractured; in tendons which have been ruptured; and even ſometimes in muſcles which have been wholly or partially torn aſunder, without any diviſion having been produced in the ſkin which covers ſuch parts. In the ſudden and violent diviſion of theſe textures, a greater or leſs quantity of blood is always effuſed into the line of ſeparation between the divided parts, and a quantity of that fluid is at the ſame time poured out alſo into the cellular membrane contiguous to or immediately ſurrounding the ſolution of continuity. When the blood which is effuſed is not very conſiderable in quantity, and when the parts from which it has been effuſed have not been too ſeverely injured, it is obſerved to be gradually abſorbed; and in proportion as the effuſed blood is abſorbed, the divided parts ſeem to approach nearer together. If the divided ſurfaces be examined a few hours after the diviſion, or ſolution of continuity, has been produced, they will be found to be covered with a ſubſtance, which, in its appearance and other properties, reſembles very exactly the coagulable lymph, or, as it is now often termed, the fibrin of the blood.

This coagulable lymph appears to be effuſed very ſoon after the injury. Profeſſor Thomſon found, that in animals, a diſtinct layer of it was effuſed over their wounds in leſs than four hours. (P. 209.) But, ſays he, whatever may be the period at which it is firſt formed, it is now well aſcertained, that in healthy ſubjects, when fractured, torn, or ruptured ſurfaces, to which the external air has not been admitted, are properly covered with this layer of coagulable lymph, and come into contact, they ſpeedily coaleſce, and that, by this lymph becoming a living intermedium, the continuity of the divided part is at length reſtored.

Appearances, preciſely ſimilar to thoſe occurring in diviſions without communication with the external air, take place in ſimple inciſed wounds, the edges of which have been brought together before, or ſoon after the bleeding from the divided veſſels has ceaſed. If a wound of this kind be torn open ſoon after its reunion, the ſurfaces which had been united are ſeen covered with a ſubſtance reſembling an animal jelly. This is the coagulable lymph or fibrin of the blood. It has been ſuppoſed, that the lymph is poured out from the ſmaller veſſels which are divided; but profeſſor Thomſon thinks it more probable that it is chiefly, if not wholly, formed by the ſecreting action of the capillary veſſels of divided ſurfaces.

The coagulable lymph, ſoon after its exudation, becomes penetrated with blood-veſſels, which proceed from the divided ſurfaces, appear to join in the proceſs of reunion by open extremities, or, in other words, to inoſculate with one another. The blood now circulates freely through the newly formed channels of communication eſtabliſhed between the veſſels which penetrate the lymph effuſed upon the ſurfaces formerly divided. This is the ſtate or ſtage of reunion, which Mr. Hunter has denominated the adheſive inflammation. The veſſels which ſhoot into the coagulable lymph often acquire, in the courſe of a few hours, a ſize rendering them capable of being injected.

The preciſe manner in which the veſſels are extended into the coagulable lymph is ſtill unknown. It has not been poſitively ſettled, whether it is the divided veſſels which penetrate the lymph. The extremities of the larger branches are cloſed with the effuſed lymph, and removed by means of it, and their natural elaſticity, to a diſtance from each other. Dr. Thomſon conceives, that theſe circumſtances are inſurmountable bars to their immediate inoſculation; and he obſerves, that if it be the cloſed veſſels which are prolonged into the lymph, each ſmall artery, it is obvious, muſt have its correſponding vein. And though the veſſels from the oppoſite divided ſurfaces may by prolongation paſs each other in a wound, it is not eaſy to conceive the manner in which they will join, or inoſculate, nor how the artery becomes afterwards connected with the vein. But the inoſculation, or direct union of the ſmall blood-veſſels, from the oppoſite ſurfaces of wounds, however difficult to conceive or explain, is a truth undeniably eſtabliſhed. Thomſon, p. 212.

Duhamel made an experiment, which fully proves, that in the reunion of parts which have been divided, the blood-veſſels from the oppoſite ſurfaces inoſculate directly, and do not merely paſs one another. He broke the legs of ſix chickens, and after the bones had reunited, he cut through about one-third of the ſoft parts, covering the callus, or new bone. When the wound had healed up, he divided another third part, and, in the ſame manner, the remaining third part, ſparing neither blood-veſſel, tendon, nor nerve. Only one of the ſix chickens ſurvived theſe cruel operations; but upon injecting the artery at the upper part of the thigh, the injection was found to have penetrated to the loweſt part of the leg. "I cannot ſay (Duhamel remarks) whether the large veſſels, filled by the injection, were dilated capillary veſſels, or the large veſſel of the leg itſelf, which had been reunited; but the experiment proves irrefragably the inoſculation of the blood-veſſels." Later obſervations than thoſe of Duhamel (ſays profeſſor Thomſon) have ſhewn that it is by the ſmall veſſels, and not by the larger trunks, that the inoſculations are formed by which the divided parts in a limb are ſupplied with blood.

Mr. Hunter conceived that he had certainly ſucceeded in obſerving inoſculation on the tunica conjunctiva of the eye, the veſſels of which are frequently divided by ſurgeons in caſes of ophthalmy. He ſtates, that the two ends of the cut veſſel are ſeen to ſhrink; but, after a little while, they are perceived to unite, and the circulation is carried on as before. (Hunter on the Blood, &c. p. 193.) Dr. Thomſon's experiments and obſervations lead him, however, to believe, that it is not the divided extremities of the arteries that again unite, but the folds of ſmall branches, that are prolonged into the intermediate ſpace, which become the channels of communication between the larger trunks that had been divided, but the extremities of which had been previouſly cloſed.

Mr. Hunter was of opinion that blood ſometimes ſerved as a medium of reunion, or vital bond of connection between parts which have been divided, and that blood-veſſels formed and inoſculated with each other in this effuſed or extravaſated blood. The practical ſurgeon, however, finds the interpoſition of this fluid between the ſurfaces of a wound diſadvantageous, and if any material quantity be ſo ſituated, it always becomes a certain impediment to union by the firſt intention. There are, it is true, ſome inſtances in which

this proceſs is not prevented by the preſence of inconſiderable effuſion of blood; but even in theſe caſes, profeſſor Thomſon doubts whether the blood be not abſorbed before adheſion takes place.

The lymph which is thrown out during adheſive inflammation, profeſſor Thomſon and the generality of modern ſurgical writers conſider to be invariably formed by a proceſs analogous to ſecretion or exhalation.

Our knowledge of the proceſs of adheſion, or of union by the firſt intention, has been conſiderably extended by the attempts which have at different times been made to repair and improve thoſe parts of the human body which had been cut off, or otherwiſe mutilated. Celſus treats profeſſedly of the method of repairing mutilations of the ears, lips, and noſe; but the only practice of this kind with which he was acquainted, conſiſted ſimply in paring off the callous edges of mutilated parts, in raiſing theſe edges by diſſection from the parts below them, in drawing them nearer to each other, and retaining them together with ſutures and adheſive plaſters.

Early in the ſixteenth century, a new mode of repairing mutilated parts began to be firſt practiſed in Italy. Alexander Benedictus, who publiſhed about the year 1527, particularly mentions, that ſome ingenious men had diſcovered a way of correcting the deformities occaſioned by the mutilations of the noſe. The plan conſiſted in raiſing a flap of ſkin from the arm, ſtitching it to the mutilated part, and after dividing this flap from the arm, modelling it as much as poſſible into the ſhape of the noſe. Theſe new noſes, Benedictus remarks, bear ill the cold of winter, and he gives ſome wholeſome advice about not raſhly or ſeverely pulling them, leſt they yield and come away.

This curious ſubject was afterwards noticed by Gourmelin in 1566, by Veſalius in 1569, and by Ambroſe Paré in 1582. The two latter erred in ſuppoſing it a neceſſary part of the operation to cut out a portion of the biceps muſcle.

But, ſays profeſſor Thomſon, the beſt, and by far the moſt intereſting account that is any where to be found of this mode of repairing mutilated parts, is that which is contained in the elaborate and not inelegant, though certainly prolix work of the celebrated Gaſpar Taliacotius, entitled "De Curtorum Chirurgia per Inſitionem," printed at Venice 1597. He deſcribes moſt minutely and circumſtantially his manner of reſtoring, by engraftment, noſes, lips, and ears, which had been cut off. He gives a full account of the mode of preparing the flap of ſkin upon the arm; the manner in which it was to be marked out, and a ſlip of cloth inſerted under it for ſome days; of the diviſion of the upper extremity of this flap from the arm; of paring the mutilated part, and ſewing, with mathematical preciſion, the flap to the noſe; of the apparatus neceſſary for retaining it in this poſition; of the diviſion of the lower end of the flap from the arm, after a union had taken place between the noſe and the flap; of the modelling, or configuration of the ſeptum; of the plaſters and bandages to be applied in this ſtage of the proceſs; and of the means to be uſed for ſome time to defend the noſe from accidental injury. He then treats, in ſeparate chapters, of the repair of the upper and lower lips, and of the formation of new ears. The inſtruments to be employed, and the progreſs of the artiſt in the different ſtages of his work, are likewiſe illuſtrated in twenty-two plates.

In the repair of the upper lip, this part was joined, like the noſe, to the upper extremity of the flap; but in that of the lower lip, it became neceſſary to divide the lower end of the flap firſt from the arm, and connect it with the lip, ſo that the ſkin of the engrafted part might always be outermoſt.

The occaſions for imitating the mode of practice ſo fully deſcribed by Taliacotius, now ſeldom occur in Europe; but in India, where the puniſhments are in ſome places ſimilar to thoſe which were inflicted in Europe in the time of Taliacotius, the art of reſtoring noſes is ſtill held in conſiderable repute. The Indian method differs from the Taliacotian chiefly in taking the flap of ſkin of which the new noſe is to be formed, from the forehead inſtead of the arm. See Gent. Mag. Oct. 1794. Alſo, An Account of Two ſucceſsful Operations for reſtoring a loſt Noſe from the Integuments of the Forehead, &c. by J. C. Carpue.

Boyer mentions, that the late M. Chopart had employed a piece of the ſkin of the neck to fill up a void ſpace left after an operation for a cancerous lip. The union took place, and a tolerably well-formed lip was procured.

It has been a queſtion, whether parts which have been completely ſeparated from the reſt of the body can be again united. This reunion, ſays profeſſor Thomſon, was long conceived to be in every inſtance impoſſible; but the ſucceſs which in ſome caſes has attended the tranſplantation of the teeth, has clearly ſhewn, that in one inſtance at leaſt, in the human body, this reunion is poſſible. Of the poſſibility of this mode of reunion in brute animals, numerous examples are to be found in authors.

Duhamel mentions, that it was a very common practice in the poultry yards in France, to engraft the ſpurs of young cocks upon their combs, and that, in this ſituation, the ſpurs were obſerved to grow to a larger ſize than when they were allowed to remain on their legs. From a variety of experiments and diſſections, Duhamel deduces the following concluſions. "We ſee then (ſays he) that an organized part, detached from the leg of a cock, when it was not bigger than a hemp-ſeed, and placed upon the head of the ſame animal, forms there an union ſufficiently intimate to become ſeveral inches in length, while it preſerves in this new ſituation its original organization in every reſpect, except in the mere circumſtance of becoming larger. This, therefore, is a true engraftment performed upon an animal. Secondly; we ſee a bony nucleus, covered firſt with a perioſteum, and then with a horny ſubſtance; in a word, a horn ſimilar to that of oxen, and which grows in the ſame manner, connected to the cartilaginous ring by the ligamentous bands which have been already mentioned. Thirdly; this horn, by its ſize, and by the continual motions of the head, being prevented from uniting firmly, or, in other words, from anchyloſing with the cranium, forms a kind of joint, furniſhed with ſeveral ligaments ſufficiently ſtrong to ſupport it. But theſe organs are not to be found in the natural ſtate, either under the comb of the cock, or in the neighbourhood of their ſpurs; at leaſt, I have never been able to perceive them there. Nature in this manner chooſes to ſupply her own wants by the developement of new organs." Duhamel in Mem. de l'Acad. des Sciences, 1746.

The experiments of Duhamel were repeated by Mr. Hunter with ſimilar reſults; and he even proſecuted the enquiry further. Amongſt other points, he endeavoured to aſcertain whether parts peculiar to the male would grow on the female; and if the parts of the female, on the contrary, would grow on the male. He took the ſpur from the leg of a young cock, and placed it in the ſituation of a ſpur in the leg of a hen chicken; it took root: the chicken grew to a hen; but, at firſt, no ſpur grew; while the ſpur which was left on the other leg of the cock grew as uſual. "This experiment (ſays Mr. Hunter) I have repeated ſeveral times in the ſame ſummer with the ſame effects, which led me to conceive, that the ſpur of a cock would not grow upon a hen, and that they were therefore to be conſidered as diſtinct

tinct animals, having very distinct powers. In order to ascertain this, I took the spurs of hen chickens, and placed them on the legs of young cocks. I found that those which took root grew nearly as fast, and to as large a size as the natural spur on the other leg, which appeared to be a contradiction to my former experiments. Upon another examination of my hens, however, I found that the spurs had grown considerably, although they had taken several years to do it; for I found that the same quantity of growth in the spur of the cock, while on the cock, during one year, was as much as that of the cock's spur on the hen in the course of three or four years; or as three or four to one." Mr. Hunter also inserted a human tooth into the comb of a cock, and there are preparations in his museum, fully proving that a vascular union was formed between these parts, as the membrane of the cavity of the tooth is seen beautifully coloured with red injection. The same distinguished observer likewise undertook experiments, with a view of learning whether the testicles of the cock would unite to the inner surface of the peritoneum of the abdomen of the hen. The attempt often failed; but four specimens are preserved in his museum, marked N° 54, 5, 6, and 7, in which a vascular union has actually taken place; and in which, though the size of the testicles does not appear to have received any addition after their attachment to the parietes of the abdomen of the hen, still their vitality had been completely preserved by the communication of blood-vessels which had been formed.

The experiment of engrafting the parts of one animal upon another, has been frequently performed on the human body in the well-known practice of transplanting teeth. That a vascular reunion may take place between the vessels of the tooth and those of the socket, seems proved by the experiments of Mr. Hunter and Mr. A. Cooper, in which the vessels of the membrane lining the cavity of the tooth, and probably the only vessels which the tooth has, were filled from the vessels of the comb, into which the tooth had been inserted.

From some facts related in the article Cranium, however, it appears, that if a dead tooth, or, in other words, one that has been for a long time pulled, be inserted into the comb of a cock, it will adhere, as well as a living or recently pulled tooth. The ingenious author of that article had seen an example of a dead tooth adhering firmly in the comb of a cock, where it had been placed by the late Mr. Moore, a dentist and lecturer in London. It is known, also, that a tooth dead in every respect may be fixed without any external mechanical means in the living socket, so as not only to remain there for months, or for years, but to become so firmly fixed as not to admit of being readily pulled out, and to serve very well for the purpose of mastication. Professor Thomson informs us, that this fact was first mentioned by M. Fauchard, and the observation has been confirmed by cases, related by M. Bourdet in his book on the Art of the Dentist, p. 199. The union of the dead tooth to the living socket must be effected in all probability by the contraction of the socket around the inequalities of the fang and neck of the tooth; for the art of fixing a dry tooth principally consists in making several notches on its root with a file, before it is introduced into the socket. Bourdet remarks, that though this operation often succeeds, it does so less frequently than the transplantation of fresh teeth.

If we exclude from consideration the transplantation of teeth, the instances of the reunion of parts which have been entirely separated, are very rare in the human body; so rare indeed, says Dr. Thomson, that most practitioners still treat with disbelief and ridicule the few instances which have been put upon record. But, he properly observes, that the different facts which have been learned respecting the transplantation of the teeth, together with the experiments of Duhamel and Mr. Hunter, prove indisputably the possibility of parts being reunited, which have been completely separated from the animal system, to which they belonged, and in which the circulation of the blood must necessarily have ceased for a time. The reader will find a variety of cases, proving the accuracy of this statement, collected in professor Thomson's valuable Lectures on Inflammation, p. 239, &c. It is to be acknowledged, at the same time, that when surgeons have attempted to reunite parts which had been entirely separated from the body, they have generally failed. But should the part retain the connection of only a few fibres, before it is replaced for the purpose of union, the circumstance makes an important difference; and union is then more frequently accomplished. The writer of this article was lately informed of a case, in which an ear, entirely separated, with the exception of a very slender piece of skin, was successfully reunited to the head again.

For most of the preceding observations, we are indebted to professor Thomson's Lectures, a work which displays a profound knowledge of all the most important doctrines of surgery.

Some additional observations on union by the first intention, and on the best means of promoting it, will be found in the article Wounds.

Union, in *Geography*, one of the Grenadine islands, in the West Indies. N. lat. 12° 30′. W. long. 61° 20′.

Union, a town of America, in the district of Maine and county of Lincoln, containing 1266 inhabitants; 50 miles N.E. of Brunswick.—Also, a town of the state of Connecticut, in the county of Tolland, containing 752 inhabitants; 12 miles E. of Tolland.—Also, a village of New York, in the township of Nassau, and county of Rensselaer, situated on the turnpike road to New Lebanon, 11½ miles about S.E. from Albany; with 50 houses and stores, a church, and a post-office of the same name, and incorporated as a village.—Also, a village of New York, in Greenwich, Washington county, situated on the Battenkill, 34 miles N. of Albany, and incorporated as a village; containing 48 houses and stores, two meeting-houses, an academy, two extensive cotton, and 12 woollen manufactures, several mills, a trip-hammer, a manufactory of files and of cast-steel, and about 500 inhabitants.—Also, a village of Albany county, in the township of Bern, 21 miles from Albany, on the road to Schoharie, from which it is distant 14 miles. It contains about 26 dwellings, several stores, &c. and a Presbyterian meeting-house.—Also, a village of New York, in Clinton county, pleasantly situated on a handsome plain, in the township of Para, 3 miles N. of the bridge across the Table river; 150 miles N. of Albany; in which are a post-office, 45 houses and stores, a Quaker meeting-house, and some other buildings.—Also, a town of Essex county, in New Jersey, containing 1428 inhabitants.—Also, a township of Berks county, in Pennsylvania, containing 766 inhabitants.—Also, a township of Huntingdon county, in Pennsylvania, containing 706 inhabitants.—Also, a township of Fayette county, containing 1821 inhabitants.—Also, a township of Mifflin county, Pennsylvania, containing 1114 inhabitants.—Also, a township of Belmont county, in Ohio, containing 1514 inhabitants.—Also, a township of Champaign county, in Ohio, containing 861 inhabitants.—Also, a township of Delaware county, in Ohio, containing 165 inhabitants.—Also, a township of Fayette county, in Ohio, containing 503 inhabitants.—Also, a township in Gallia county, Ohio, containing 367 inhabitants.

bitants.—Also, a township of Highland county, Ohio, containing 744 inhabitants.—Also, a township in Knox county, Ohio, containing 431 inhabitants.—Also, a township in Licking county, Ohio, containing 375 inhabitants. —Also, a township in Madison county, Ohio, containing 250 inhabitants.—Also, a township in Miam county, Ohio, containing 683 inhabitants.—Also, a township in Muskingum county, containing 430 inhabitants.—Also, a township in Ross county, Ohio, containing 2273 inhabitants.—Also, a township in Scioto county, Ohio, containing 541 inhabitants.—Also, a district of South Carolina, containing 10,995 inhabitants.

UNION *Borough*, a town in Fayette county, Pennsylvania, containing 999 inhabitants.

UNION *River*, a river of the district of Maine, which runs into Penobscot bay.

UNION *Springs*, a post-office in the south-west corner of Aurelius, in Cayuga county.

UNION *Fire-Office*. See INSURANCE.

UNIONS, UNIONES, in *Physiology*, the same with *margaritæ*, or *pearls*. See PEARL.

UNIQUE is sometimes anglified, and used to denote a thing which is the only one of its kind.

UNISETA, in *Natural History*, the name of a species of fly, found frequently sitting on the ammi or bishops weed, and distinguished by having one long hair or bristle growing out at its tail. See HENOTHRIX.

UNISON, in *Music*, is the effect of two sounds, which are equal, in degree of tune, or in point of gravity and acuteness.

Unison may be defined a consonance of two sounds, produced by two strings, or other bodies of the same matter, length, thickness, and tension, equally struck and at the same time; so that they yield the same tone or note.

Or it is the union of two sounds, so like each other, that the ear, perceiving no difference, receives them as one and the same sound. See SOUND.

What constitutes *unisonance* is the equality of the number of vibrations of the two sonorous bodies in equal times; where there is an inequality in that respect, and, of consequence, an inequality in degree of tune, the unequal sounds constitute an interval.

Since isochronous vibrations produce sounds that are musical, and that are said to continue at the same pitch, and slower vibrations produce graver, flatter, or lower sounds, and quicker vibrations produce sounds that are acuter, sharper, or higher; it follows, that if several strings, however different in length, thickness, density, and tension, or other sounding bodies, vibrate all together in equal times, their sounds will have one and the same pitch, however they may differ in loudness, or other qualities, and are, therefore, called unisons; and, on the contrary, the vibrations of unisons are isochronous. This observation reduces the theory of all sorts of musical sounds to that of the sounds of a single string, with respect to gravity or acuteness. Consequently, the wider and narrower vibrations of a musical string, or of any other body sounding musically, are all isochronous very nearly: otherwise, while the vibrations decrease in breadth till they cease, the pitch of the sound could not continue the same as we perceive it does, if the first vibrations be not too large; in which case, the sound is a little acuter at the beginning than afterwards. In like manner, since the pitch of the sound of a string or bell, or other vibrating body, does not sensibly alter, while the hearer varies his distance from it; it follows, that the larger and lesser vibrations of the particles of air, at smaller and greater distances from the sounding body, are all isochronous; and consequently, that the little spaces described by the vibrating particles are every where proportional to the celerity and force of their motions, as in a pendulum; and this difference of force, at different distances from the sounding body, causes a difference in the loudness of the sound, but not in its pitch. It follows also, that the harmony of two or more sounds, according as it is perfect or imperfect at any one distance, will also be perfect or imperfect at any other distance; and this is a known fact, *e. gr.* in a ring of bells. If two musical strings (see STRING) have the same thickness, density, and tension, and differ in length only, mathematicians have demonstrated, that the times of their single vibrations are proportional to their lengths. Hence, if a string of a musical instrument be stopped in the middle, and the sound of the half be compared with that of the whole, we may acquire the idea of the interval of two sounds, whose single vibrations (*i. e.* the times) are in the ratio of 1 to 2; and by comparing the sounds of $\frac{2}{3}$, $\frac{3}{4}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{8}{9}$, $\frac{9}{10}$, &c. of the string with the sound of the whole, we may acquire the ideas of the intervals of two sounds, whose single vibrations are in the ratio of 2 to 3, 3 to 4, 3 to 5, 4 to 5, 5 to 6, 8 to 9, and 9 to 10, &c. See CHORD. Smith's Harmonics, p. 2, &c.

Unison is the first and greatest of concords, and the foundation, or, as some call it, the *mother* of all the rest; yet others deny it to be any concord at all, maintaining it to be only that in sounds, which unity is in numbers.

These restrain the word *concord* to intervals, and make it include a difference of tune: but this is precarious; for as the word *concord* signifies an agreement of sounds, it is certainly applicable to unisons in the first degree.

But though *unisonance*, or an equality of tune, makes the most perfect agreement of sound, it is not true that the nearer any two sounds come to an equality of tune, they are the more agreeable. The mind is delighted with variety; and the reason of the agreeableness or disagreeableness of two sounds must be ascribed to some other cause than the equality or inequality of the number of their vibrations.

It is a famed phenomenon in music, that an intense sound being raised, either with the voice, or a sonorous body, another sonorous body near it, whose tune is either unison, or octave to that sound, will sound its proper note unison, or octave, to the given note.

The experiment is easily tried by the strings of two instruments; or by a voice and an harpsichord; or a bell, or even a drinking-glass.

This our philosophers account for thus: one string being struck, and the air put in motion thereby; every other string, within the reach of that motion, will receive some impression therefrom: but each string can only move with a determinate velocity of recourses or vibrations; and all unisons proceed from equal, or equidiurnal vibrations; and other concords from other proportions. The unison string, then, keeping equal pace with the sounded string, as having the same measure of vibrations, must have its motion continued, and still improved, till its motion become sensible, and it give a distinct sound. Other concording strings have their motions propagated in different degrees, according to the frequency of the coincidence of their vibrations with those of the sounded string: the octave, therefore, most sensibly; then the fifth; after which, the crossing of the motions prevents any effect.

This they illustrate (as Galileo first suggested) by the pendulum, which being set a moving, the motion may be continued and augmented, by making frequent, light, coincident impulses; as blowing on it when the vibration is just finished: but if it be touched by any cross or opposite motion, and this, too, frequently, the motion will be interrupted, and cease altogether. So of two unison strings, if the

the one be forcibly ſtruck, it communicates motion, by the air, to the other; and both being equidiurnal in their vibrations, that is, finiſhing them preciſely together, the motion of that other will be improved and heightened, by the frequent impulſes received from the vibrations of the firſt, becauſe given preciſely when that other has finiſhed its vibration, and is ready to return: but if the vibration of the chords be unequal in duration, there will be a croſſing of motions, leſs or more, according to the proportion of the inequality; by which the motion of the untouched ſtring will be ſo checked, as never to be ſenſible. And this we find to be the caſe in all conſonances, except uniſon, octave, and the fifth. See CHORD.

UNISSONI, Ital. This word written at full length, or abridged over an empty ſtaff in a ſcore, if over the ſecond violin, implies that it is to play in uniſon with the firſt; if over the firſt violin in vocal muſic, that it is to play in uniſon with the voice.

UNIT, UNITE, or *Unity*, in *Arithmetic*, the number *one*, or one ſingle individual part of diſcrete quantity. See NUMBER.

If a number conſiſts of four or five places, that which is outermoſt towards the right end, is called the place of units.

Number, in general, is by Euclid defined to be μοναδων πλοοτης, a multitude, or aggregate of units; but, in this ſenſe, unity is not a number.

UNITARIANS, in *Eccleſiaſtical Hiſtory*, a name given to thoſe who confine the glory and attribute of divinity to the *One*, only great and ſupreme God, and father of our Lord Jeſus Chriſt; and who maintain, that this one ſupreme God is the only object of religious worſhip.

This denomination is ſometimes applied to thoſe that are otherwiſe called Arians; but it is now more commonly appropriated to the Socinians, who maintain that the Father alone is the God of the univerſe, the only true God; that our Lord Jeſus Chriſt was a mere man, with a reaſonable ſoul and human body, who had no exiſtence before he was born, either in the ordinary courſe of nature, or by the immediate operation and miraculous power of God, at Bethlehem, and who, in the courſe of his life and miniſtry, death, reſurrection, and exaltation, was honoured with peculiar and extraordinary tokens of the divine influence and favour; and that the Holy Spirit was not a perſon, or diſtinct intelligent agent, but only the power, influence, and energy of God. Some, in imitation of Socinus, allow that Chriſt is an object of worſhip; but moſt of the modern Unitarians reſtrict prayer and divine worſhip to God alone: and this conſtitutes the diſtinction between Unitarians and other Chriſtians, though many of the modern Socinians, renouncing that diſcriminating diſtinction, have appropriated the appellation, without ſufficient reaſon, to themſelves.

For an account of the progreſs of Unitarianiſm in our own country, ſee an Hiſtorical View of the State of the Unitarian Doctrine and Worſhip from the Reformation to our own Times, by Mr. Lindſey, 8vo. 1783.

UNITAS FRATRUM, or *United Brethren*, a name diſtinguiſhing thoſe Chriſtians who are frequently called abroad Herrnhuters, and with us Moravians.

To thoſe who are acquainted with the hiſtory of this ſect, it is well known, that their moſt approved writers have taken great pains to derive their origin from thoſe formerly diſtinguiſhed by the appellation of Moravian or Bohemian Brethren, and who were afterwards denominated Huſſites.

Moſheim, however, obſerves, that they may be ſaid with more propriety to imitate the example of that famous community, than to deſcend from thoſe who compoſed it: for, he adds, it is well known, that there are very few Bohemians and Moravians in the fraternity of the Herrnhuters; and it is extremely doubtful, whether even this ſmall number ſhould be conſidered as the poſterity of the ancient Bohemian brethren that diſtinguiſhed themſelves ſo early by their zeal for the Reformation. But from the Moravian writers, and from Crantz in particular, *ubi infra*, we are furniſhed with a circumſtantial account of the riſe and progreſs of this ſect from the ninth century, when the Bohemians and Moravians, and the whole Sclavonian nation, were firſt proſelyted to the faith of Chriſtianity, to the revival of it by count Zinzendorff. To this purpoſe they allege, that when by the inſtrumentality of Methodius and Cyrillus, two Greek monks, Bogaris, king of Bulgaria, and king Suatopluck, in Moravia, were converted, they and their reſpective countries united with the Greek church; Methodius being the firſt biſhop, and Cyrillus having tranſlated the bible into the Sclavonian language. After various ſtruggles, the Greek Chriſtians were conſtrained to ſubmit to the ſee of Rome. Some few, however, ſtill adhered to the rites of the Greek church, who, in 1176, being joined by the Waldenſes and inſtructed by them, aſſociated in acts of worſhip, and ſent miſſionaries into many countries. In this ſtate they continued for more than two hundred years, till a ſevere perſecution was commenced againſt them in 1391. In the beginning of the next century they acquired the denomination of Huſſites, and were alſo called at different periods *Fratres Legis Chriſti*, or Brethren of the Law of Chriſt; *Unitas Fratrum*, or the Unity of the Brethren; or *Fratres Unitatis*, United Brethren. Notwithſtanding very ſevere treatment, they maintained ſtrict church diſcipline among themſelves; and, at the ſynod of Lhota in 1467, choſe twenty, and out of theſe nine perſons, of whom they appointed three by lot for elders.

Having, at this time, no biſhops of the Bohemian church who had not ſubmitted to the ſee of Rome, they obtained conſecration for three of their prieſts of Stephen, biſhop of the Waldenſes in Auſtria; and theſe, on their return, ordained ten co-biſhops, or conſeniors, from among the reſt of the preſbyters. After many intervals of perſecution and of peace, towards the beginning of the ſixteenth century, there were two hundred congregations in Bohemia and Moravia, which had the bible tranſlated into the Bohemian tongue, firſt from the Vulgate, and afterwards another from the original text.

In 1523, after the dawn of the Reformation, a friendly correſpondence commenced between the Brethren and Luther, and afterwards with Calvin, and others of the reformers. This correſpondence involved them in a ſevere perſecution, which greatly oppreſſed and diſpirited them. The diſſenſions alſo that prevailed amongſt themſelves threatened their ruin, which were, at length, happily terminated at the ſynod of Sendomir, in 1570, when the three *Tropuſſes*, (*i. e.* thoſe who held different tenets and rites with regard to non-eſſentials,) *viz.* the epiſcopal brethren, the Lutheran, and reformed, or followers of Calvin, agreed that they would perform divine ſervice and communicate together. In 1575 they obtained an edict for the public exerciſe of their religion, which was confirmed in 1609, when they obtained leave to erect new churches. But, in 1612, a civil war broke out in Bohemia; and, in 1621, a violent perſecution occaſioned the diſperſion of their miniſters, and great diſtreſs to the Brethren in general. Among the miniſters was one John Amos Comenius, biſhop of the church of the Brethren. Crantz has given the ſucceſſion of the Bohemian, Moravian, and Poliſh biſhops from Stephen, in 1467, to the renewal of the church of the United Brethren in this century. In 1662, Comenius conſecrated Peter Figulus, commonly called Jablonſky; and, in 1699, his ſon, Daniel Erneſt Jablonſky, was conſecrated biſhop; and by him, it is ſaid, the epiſcopal ordination has been com-

committed to the present Unity of the Brethren, adhering to the Augsburg confession, renewed by the emigration of many out of Bohemia and Moravia. This emigration was so considerable, and such numbers of others conformed to the rites of the church of Rome, that, at the close of the seventeenth century, it was apprehended that this ancient church was become utterly extinct.

Several, however, it is said, continued in Bohemia and Moravia, and retained their principles in secret; and from these the Moravian writers derive the present church, known by the name of Unitas Fratrum, or United Brethren, which, they say, is a renewal and continuation of the ancient church. About the year 1720, the revival commenced among the posterity of the Brethren about Fulneck in Moravia, and Leutomischel in Bohemia. In Moravia, one Christian David had been the chief instrument of the edification of his brethren, and the instructions which he received from ministers, whose names were Schoefer and Schwedler, he communicated, in 1717, to the descendants of the ancient Brethren. But being persecuted in their native country, some of them migrated under the conduct of Christian David, and, in 1722, put themselves under the protection of Nicholas Lewis, count of Zinzendorff, in Upper Lusatia; where they built houses upon the hill called the *Huthberg, Huth des Herrn, i. e.* the Watch Hill, and hence the new settlement was called *Herrnhut, i. e.* the Watch of the Lord, and the Brethren were denominated *Herrnhuters.* The count soon after removed to Bertholsdorff, and superintended their rising settlement. Count Zinzendorff says of himself, that he had formed a design, when only ten years old, of collecting a small society of believers, who should altogether employ themselves in exercises of devotion under his direction. Accordingly, when he became of age, in the year 1721, he settled at Bertholsdorff, and was soon after joined by a number of proselytes. In 1724, more emigrants arrived at Herrnhut from Moravia, just as the Brethren were beginning to lay the foundation of an edifice intended for the education of the children of the noblesse, for printing cheap bibles, and preparing medicines for their neighbours, in which building was also to be a chapel.

It would far exceed our limits to recount the successive emigrations to Herrnhut, and the additions that were made by the means of the preaching of the Rev. Mr. Rothe, minister at Bertholsdorff, and the zeal of Christian David. Among these settlers there were persons of different opinions, which engaged the attention of count Zinzendorff, who endeavoured to establish an union among them in the fundamental truths of the Protestant religion, and, in 1727, formed statutes for their government in conformity to these truths.

From this period in particular, when elders and wardens were chosen, and an union established between the Brethren from Moravia, both among themselves, and with their Lutheran and reformed Brethren, the Moravian writers date the renewal of the Unity of the Brethren. The whole congregation was divided into classes of married men, married women, widowers, widows, maids, bachelors, and children, called choirs; and one of their own sex and station in life appointed to have the special care of each choir, under the inspection of the elders. The officers were appointed by lot, which has continued to be the case to the present day.

Particular attention was paid by these several classes to the instruction of youth; and as a great part of their worship consisted in singing, they proposed to instruct their children in their religion by hymns. There are some persons of both sexes appointed by rotation to pray for the society, who are said to be admonished of their duty by an inward feeling; and to determine the divine will in particular cases by casting lots. All matrimonial contracts are subject to the direction and approbation of the elders. Such was the origin of the new sect, denominated Herrnhuters; or, as others say, the revival of that of the Moravian Brethren. In process of time, however, it became very considerable and extensive; and it adopted tenets and practices of a very singular kind. Some have charged it with adopting very pernicious notions, and with recommending very unwarrantable practices; such as disfigure the truths of the gospel, and sap the foundations of morality. The count is accused of speaking in very derogatory terms of the scripture, and with expressly asserting that the reading of the scripture appears to him to be more dangerous than useful to the society. To avoid idolatry, he says, people ought to be taken from the Father and Holy Ghost, and conducted to Christ, with whom alone we have to do. The Holy Ghost is called by the Herrnhuters the eternal wife of God, the mother of Christ, the mother of the faithful, and of the church. The language of their devotion has been charged with obscenity, and with exciting ideas not very chaste and decorous. Count Zinzendorff has incurred just censure by declaring, that the law is not a rule of life to a believer; that the word now belongs only to the Jews; and that a converted person cannot sin against light. It has been said, that no example can be found of a fanaticism more extravagant, and a mysticism more gross and scandalous, than those of the Herrnhuters. These charges principally depend upon the authority of Rimius, in his Candid Narrative of the Rise and Progress of the Herrnhuters, commonly called Moravians, or Unitas Fratrum, &c. 1753, and Supplement, &c. published in 1755, sanctioned by the recital of Mosheim (Eccl. Hist. vol. v.), and bishop Warburton, in his "Doctrine of Grace," vol. ii. We are persuaded, however, by unquestionable testimonies communicated to us by the Rev. B. Latrobe, a very respectable minister among the Moravians in London, that the irregularities in principle and practice that have been charged upon them are much exaggerated; and that the accusation has been chiefly owing to some unguarded expressions introduced into their discourses and forms of devotion, which, as Mr. Crantz, their historian, candidly acknowledges, "being not clear and determinate enough, and in part unrestrained, proved offensive to many divines both in and out of their congregations."

From the year 1727 to 1731, deputations were sent from Herrnhut to Denmark, Sweden, England, Livonia, Switzerland, and other places in Germany; and thus the renewed unity of the Brethren became more known.

In 1729, a deed was signed by several, and ratified by the count and Mr. Rothe, in which they declare that they are neither Separatists, nor a new sect, but descendants of the Moravian Brethren, &c.

We acknowledge, say they, no visible congregation of Christ, but where the word of God is taught in simplicity and purity, and the members lead a holy life; yet we will not separate from any one of any other Christian denomination who truly believes in Christ, though he gives a different exposition to this or the other text of Scripture, &c.

They guard against latitudinarianism in religion; they determine to maintain their ancient church discipline, without forsaking divine service in the Protestant parish church at Bertholsdorff; they agree to the confession of Augsburg: they will not be called Hussites or Lutherans, but retain their ancient name, The Brethren; thus hoping for the protection of their sovereign, and that their whole case might be examined by government.

The count's journey to Copenhagen to the coronation of Christian VI. in 1731, where he heard of the miserable condition of the negroes in the island of St. Thomas, was the occasion of the first mission of the Brethren among the heathen,

heathen, so that two Brethren went thither in the year 1732, and the mission to Greenland commenced in 1733. In 1732, the count determined to devote himself to the ministry of the gospel, and accepted the office of warden, which he had held before, in 1733. In 1734, the first Brethren went to America. The count having been examined and received into the clerical order, by the theological faculty of Tubingen, corresponded with Jablonsky, eldest bishop of the Brethren's unity, about the renewal of episcopal ordination; and he consecrated a bishop for the church of the Brethren of Berlin, with the concurrence of his colleague, the senior, or bishop of Lissa, in Poland, in 1735. And in 1737, the count himself was consecrated a bishop of the Unitas Fratrum by these three bishops; having previously obtained the opinion of Dr. Potter, archbishop of Canterbury, that the Moravian Brethren were an apostolical and episcopal church, not maintaining any doctrines repugnant to the thirty-nine articles of the church of England: and he afterwards received a congratulatory letter from the archbishop on his consecration. From this time the count is called the ordinary of the Brethren. The count seems to have been zealous and indefatigable in his labours; and it appears that, in 1739, the Brethren were dispersed in about forty places, most of which were missionaries among the heathen. New settlements were made in Europe and America; institutions for the education of children were established in many places; and many regulations were adopted for mutual edification, in conformity to the constitution of the ancient church of the Brethren. In 1748, a formal and very respectable commission, consisting of three counts, two doctors of law, and three divines, was appointed to examine the charges that had been urged against the principles and practice of the Brethren, the result of which was very favourable to them. In consequence of the report of the commissioners, the bailiwick and palace of Barby, where the college and seminary of the Brethren are now established, were ceded in lease to count Henry, twenty-eighth Reuss, and his consorts, and the chapel of the palace given to the Brethren.

In 1749, a royal mandate was published, importing, that the congregations of the Protestant Moravian Brethren, avowing the unaltered Augustan confession, should be received in all Saxony, in the same manner as in Upper Lusatia and the county of Barby.

An eminent divine of Saxony, dean of the king's chapel, became this year, with the approbation of the sovereign, honorary president of the Lutheran Tropus in the Unity of the Brethren; Dr. Cochius, dean of the king of Prussia's chapel, was, with the approbation of the king, introduced as honorary president of the reformed Tropus in the Unity, to which he had been appointed in 1746, and after his death, in 1749, was succeeded in that office by Dr. Thomas Wilson, bishop of Sodor and Man. After the state of the Brethren's church had been deliberately examined by the British parliament, an act passed on the 6th of June, 1749, in behalf of the ancient episcopal church known by the name of Unitas Fratrum.

In the mean time, as their number increased, and their local congregations became more numerous, men of different connections and principles were introduced among them; some of whom had imbibed extravagant notions, which they zealously propagated. This occasioned what they called a time of sifting in doctrine and in conduct. Their phraseology in expounding divine truths often bordered upon error; and the passions being warmed, a kind of joy took place, which produced extravagant actions. Crantz, however, observes, that this sifting did not arise from irreligious principles, nor did it end in immoral practices. Many among the Brethren were offended, and their adversaries took occasion to reproach them. The count, it is said, interposed with such success, that in the years 1750 and 1751, almost all that had been chargeable with these excesses, in doctrine and practice, acknowledged their error with shame; those who did not retract deserted them; and those, whose relapse was dreaded, were dismissed from their offices. The consequence of these excesses was, indeed, in another respect, more serious and alarming; for the count of Buedingen was so prejudiced against them, that an edict was published, requiring the inhabitants of Herrnhaag, who would not renounce the count and the ministers of the Brethren's church, to leave the country; whereas those who complied were allowed to remain in their habitations, under the protection of the reigning count. On this occasion, more than a thousand persons, from 1750 to 1753, left a beautiful village, which they had erected at a great expence, and were dispersed in other congregations in Germany, Holland, England, and America; and the French reformed Brethren and Sisters, who lived at Herrnhaag, formed a settlement at Neuwied, which is now in a flourishing condition.

The increase of the Brethren, their new settlements, and numerous journies and missions, involved the society in a great expence, and threatened ruin. Their debts were many and great, discouraged their friends, and gave their enemies occasion for censure. The count, however, became security for their whole debt, which, at a stipulated time, was discharged. As soon as they were extricated from these difficulties, new regulations were adopted to prevent future distress of a similar kind. We can only add, that the count lived to see congregations and missions settled in the four quarters of the globe; and these, it has been urged, were the most effectual apologies and defences of the principles and practice of the Brethren.

In 1760 the count died, with a memorial among the Brethren of having been their patron, and the instrument by whom God restored and built up the church of the Brethren.

But though they counted him a distinguished servant of God, yet they did not regard him as their head; for they acknowledged, from the beginning, no other head and elder but the Lord Jesus Christ, and no other father but the Father in heaven.

At the first synod of the Unity, after his decease, in 1764, a number of Brethren were chosen to have collectively the superintendency of the whole Unity; and, in the following synods, the arrangement then made was continued with some amendments. This company is called the Elders Conference of the Unity, and consists of thirteen Brethren, who are chosen at every synod of the whole Unity.

The Brethren appeal to their lives for a refutation of the calumnies that have been circulated against them, professing themselves to be a people who walk in honesty and godliness as followers of the Lord Jesus Christ: and, as to doctrine, they avowedly adhere to the Augsburg, or Augustan confession; and, with respect to this, the public, we are informed, may read an exposition of Christian doctrine as taught in the church known by the name of Unitas Fratrum.

In England, the congregations belonging to the Unitas Fratrum are the following: viz. two in London; one at Bedford, where are houses belonging to the single Brethren and single Sisters, to which belong their chapels and societies at Northampton, Risely, &c.; one at Ockbrook, near Derby; one at Fulneck, near Pudsey, in Yorkshire, where are houses for the single Brethren, and Sisters, and widows, and schools for children; to this the members of the societies near Leeds and Bradford belong; one at Wyke, near Halifax, another at Merfield, and another at Little Gummersal; one at Duckenfield, in Cheshire, where they have two

two choir houses, one for the single Brethren, and one for the single Sisters; one at Leominster, in Herefordshire; one at Bristol, where are houses for the single Brethren and Sisters, to which belongs that at Kingswood; one at Bath; one at Tetherton, in Wiltshire, to which the chapel at Malmesbury belongs: a congregation was also collected, in 1759, at Haverfordwest, in Pembrokeshire. Besides these congregations, the Brethren have chapels in several parts of England; *viz.* at Apperly, in Gloucestershire; Frome, in Somersetshire; Plymouth, in Devonshire; Eden and Culworth, in Northamptonshire.

The wild enthusiasm of this sect forms as singular a contrast with the wisdom and perseverance of their attempts to convert and civilize the heathens, as the smallness of their own numbers does with the variety and distant scenes of their missionary undertakings. Their numbers did not exceed 600, when they first began their attempt to convert the heathens; and, in the period of eight or nine years, they sent missionaries to Greenland, to St. Thomas's, to St. Croix, to Surinam, to the Rio de Berbice, to the Indians of North America, to the negroes of South Carolina, to Lapland, to Tartary, to Algiers, to Guinea, to the Cape of Good Hope, and to the island of Ceylon. We cannot follow Dr. Brown (*ubi infra*) through his details of these missions, which he has derived from the well-known works of Crantz, and the periodical accounts. In Greenland, where they have three settlements, *viz.* at New Hernhuth, Lichtenfels, and Lichtenau, the number of Christians, in the year 1810, was 998; but it appears to be diminishing, not so much from their defection to Paganism, as from a general decrease in the population of this inhospitable region. In St. Thomas's, where their number, in 1812, was 2285, and St. Croix, where they have three congregations, consisting in 1812 of 8443 persons, they have been favoured by the ruling powers, and have been very successful; in Jamaica, their undertaking has been viewed with jealousy, and they have made little progress; while in Antigua they have established the most flourishing of all their missions, and reckon 11,824 members of their different congregations. Their efforts on the continent of America, both North and South, have been almost uniformly unprosperous; at Berbice the settlement was broken up in 1763, by a rebellion of the negroes; at Hope, on the river Corentyn, in Surinam, after several partial calamities, they were dispersed in 1808, in consequence of the burning of their settlement; and at Bambey and Paramaribo their establishments appear to be on the point of dissolution. The missions to North America have been almost without exception disastrous. However, they have five settlements among the Indians.

Their late missions, excepting the one that went to the Cape, appear to have been undertaken with very little prudence, and attended with no success. In the year 1812, according to an estimate by Mr. Latrobe, they had 33 settlements among the heathen, under whose care were 27,000 converts. From the account given of their method of conversion, it should seem that argument and evidence have nothing to do with it; since they never enter into any discussions concerning the several truths or doctrines of religion, till the savages appear to *believe in Christ*, and to feel the transforming influence of the gospel on their hearts and lives. Stripped of its technical language, the meaning of this statement is that the passions, and not the judgment, are the channel by which conviction is brought to the mind; and that conversion must begin by exciting terror or sympathy, before any knowledge of the cause of either can be acquired. The ultimate effect, however, is good, though the process is absurd; and perhaps no alternative presents itself but that of beginning, like the Quakers in America, with cultivating the understanding before the evidence of Christianity is proposed to it; or operating by impassioned oratory and awful denunciations, on those feelings and sympathies which man in every condition carries within him, and which are even most powerful where the least of intellectual culture exists.

For other particulars relating to the sentiments, discipline, mode of worship, &c. of the Unitas Fratrum, we must refer to Crantz's Ancient and Modern History of the Brethren, 8vo. published in 1780, by the Rev. B. Latrobe; and to a Concise Historical Account of the present Constitution of the Unitas Fratrum, translated from a work entitled Neueste Religions Geschichte, by Dr. Walch, of Goettingen, and published in 1775, by Mr. Latrobe. See also Crantz's History of Greenland, &c. published in 2 vols. 8vo. 1767. A Succinct View of the Missions established among the Heathen by the Church of the Brethren, in a Letter to a Friend, by M. Latrobe, in 1771; and a Brief Account of the Mission established among the Esquimaux Indians, on the Coast of Labrador, in 1774. Brown's History of the Propagation of Christianity among the Heathen, since the Reformation, 2 vols. 8vo. London, 1817.

UNITE, in the *Manege*. See UNION.

UNITED AFFECTION. See AFFECTION.

UNITED *Flowers*, in *Botany* and *Vegetable Physiology*, are such as are furnished with stamens and pistils in the same flower. This term has been thought more commodious and unexceptionable, in English, than any translation of the Greek ἑρμαφρόδιτος, however just and proper the latter may be in scientific or learned works. Most flowers come under the above description, the separation of the stamens and pistils, either in distinct flowers on the same plant, or upon different plants, of the same species, being far less common. Such a separation, however, when it does occur, presents one of the strongest evidences in favour of the Linnæan doctrine of impregnation; and decidedly refutes the opinion of Tournefort, that the anthers were destined to carry off excrementitious matter from the germen and young seeds, as the kidneys of animals secrete urine. The reniform structure of the anthers, in many cases, may offer an *apology*, it cannot be called a *reason*, in favour of such a doctrine. See FECUNDATION *of Plants*.

The advantage of the union of both organs of impregnation in the same flower, as vegetables are not endowed with voluntary motion, is obvious. But nature seems occasionally under some disadvantage in bringing both to perfection; and one or other is rendered, by circumstances, deficient in its usual power. Thus in *Mentha* and *Lilium*, the increase by root being inordinate, the stamens become imperfect in some flowers, the pistils in others. In *Rhodiola*, which scarcely differs in any material respect from *Sedum*, they are always so, on distinct plants. Polygamous flowers (see POLYGAMIA) exhibit a sort of precaution in nature, to guard against any casual imperfection, from starvation, in either organ of united flowers. This is effected by providing a superfluous stock of stamens, for these generally predominate, in separate individuals, whose vigour is not impeded by the maintenance of any pistil of their own, and which are, therefore, at full liberty to supply the deficiencies of their neighbours.

UNITED *Provinces*, in *Geography*, a name given to the seven Protestant states of the Netherlands, which threw off the yoke of Spain, and became independent. (See HOLLAND and NETHERLANDS.) These now form a distinct kingdom, and by an arrangement which has taken place since the French revolution, William Frederick, grand duke of Luxemburgh, and prince of Orange and Nassau, is king of the Netherlands. This prince married princess Frederica Sophia of Prussia, October 14, 1791, by whom

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he has issue, William Frederick, hereditary prince, a general in the British army, married Feb. 21, 1816, to the grand duchess Anne, sister to the emperor of Russia; and Frederick.

UNITED *States*, comprehend an extensive portion of North America, situated between 25° 50′ and 49° 37′ N. lat., and between 10° E. and 48° 20′ W. long. from Washington. The most northern part is bounded by a line running due W. from the N.W. corner of the Lake of the Woods, and the southern extremity is the outlet of the Rio del Norte. The eastern extremity is the great Menan island, on the coast of Maine, and the western is Cape Flattery, N. of Columbia river, on the Pacific ocean. The greatest extent of the country from N. to S. is 1650 miles, and from E. to W. 2700. The area is about 2,379,350 square miles, or 1,522,784,000 acres. The population by the last census was 7,239,903, being less than three to each square mile of territory, so that every inhabitant has nearly 200 acres of land. The United States are bounded on the E. by the Atlantic ocean, and the British province of New Brunswick; on the N. by the British possessions of Lower and Upper Canada, and the large unsettled country to the westward of those provinces; on the W. by the Pacific ocean; on the S.W. by the Spanish internal provinces and the Rio del Norte; and on the S. by the gulf of Mexico and Florida. In the definitive treaty of peace between the United States and Britain, executed at Paris on the 3d of September, 1783, the northern and eastern boundaries are described as follows, *viz.* "From the N.W. angle of Nova Scotia; *viz.* that angle which is formed by a line drawn due N. from the source of St. Croix river to the Highlands; along the said Highlands which divide those rivers that empty themselves into the river St. Lawrence, from those which fall into the Atlantic ocean, to the north-westernmost head of Connecticut river; thence down along the middle of that river, to the 45th degree of N. lat.; from thence by a line due west on said latitude, until it strikes the river Iroquois or Cataraquy; thence along the middle of said river into lake Ontario, through the middle of said lake until it strikes the communication by water between that lake and lake Erie; thence along the middle of said communication into lake Erie, through the middle of said lake until it arrives at the water communication between that lake and lake Huron; thence along the middle of said water communication into lake Huron; thence through the middle of said lake to the water communication between that lake and lake Superior; thence through lake Superior northward of the isles Royal and Philipeaux, to the Long Lake; thence through the middle of said Long Lake and the water communication between it and the Lake of the Woods, to the said Lake of the Woods; thence through the said lake to the most north-western point thereof, and from thence on a due west course to the river Mississippi. East by a line to be drawn along the middle of the river St. Croix, from its mouth in the Bay of Fundy to its source, and from its source directly N. to the aforesaid Highlands which divide the rivers that fall into the Atlantic ocean from those which fall into the river St. Lawrence; comprehending all islands within twenty leagues of any part of the shores of the United States, and lying between lines to be drawn due E. from the points where the aforesaid boundaries between Nova Scotia on the one part, and East Florida on the other, shall respectively touch the bay of Fundy and the Atlantic ocean; excepting such islands as now are, or heretofore have been, within the limits of the said province of Nova Scotia."

As to the country west of the Lake of the Woods, it is evident that the commissioners were of opinion, that it should be part of the territory of the United States, as high as a line to be run due W. from the N.W. corner of that lake until it reached as far W. as the Mississippi; which was at that period the western boundary of the United States. Subsequent events have annexed the whole of Louisiana to the country, so that the northern boundary of it behoves to be ascertained, as it was possessed by France; but the country never having been settled, the boundary has not been accurately defined. The best course, says Mr. Melish, in the construction of his map, has appeared to be to run the boundary line due W. from the N.W. corner of the Lake of the Woods to the gulf of Georgia, and thence along that gulf, and the straits of Juan de Fuco, to the Pacific ocean. As the French were the first settlers in Louisiana, maps founded on their claims furnish evidence as to the western limits of Louisiana of undisputable authority, and fix the boundary line on the W. side of the Rio del Norte, to the Rio Salado, corresponding to the Rio Puerco of more modern maps: and it is continued along that river nearly to its source. From thence it passes to the E. of Santa Fé, to between the 37th and 38th degrees of N. lat., where it crosses the Rio del Norte, and is so continued to about half a degree W. of that river; then along that river to its source, where the limits of Louisiana are undefined. Towards the Pacific ocean, we have no very correct data, says Mr. Melish, for forming an opinion as to the boundaries. The following view of the subject, he says, is the result of the best information that can be obtained.

The Missouri and its waters are unquestionably part of the United States territory, in virtue of the purchase of Louisiana; and it is presumed, that the title is equally unquestionable as to the Columbia and its waters, to a line drawn due W. from the N.W. corner of the Lake of the Woods. This includes the Multnomah on the S., but leaves the question undetermined in the unexplored country between that river and the bay of St. Francisco. From the latest accounts, it appears that the Spaniards have no settlements above that bay, and probably will have none, so that the country may be considered virtually a part of the United States territory, provided they should consider it of importance to take possession, and settle it.

The face of the country in the United States presents every variety. The north-eastern part on the coast is broken and hilly; and is remarkably indented with numerous bays and inlets. Towards the S., and along the gulf of Mexico, the land is level and sandy, interspersed with many swamps, and numerous islands and inlets. At the outlets of many of the rivers, there is a large portion of alluvial land, which is particularly the case along the Mississippi. Beyond the head of tide waters, there is a tolerably rich and agreeably uneven country, which extends to the mountains. The mountainous district, on the Atlantic side of the country, is about 150 miles in breadth, and 1200 miles in length; extending in large ridges from N.E. to S.W. These ridges are generally known by the name of the Allegany mountains, and are of various elevations, from 2000 to 4000 feet. The highest point seems to be the White Hills, in New Hampshire, which rises to the elevation of nearly 9000 feet. Beyond the mountains we have a view of the great valley of the Mississippi and its tributary streams, presenting a body of the finest land in the world, and possessing great natural advantages. To the westward of this valley are the mountains of Louisiana, presenting features singularly bold and grand. The rocky mountains, in particular, are very majestic; and the vast variety produced by the great mass of waters forming the tributary streams of the Missouri and Columbia, must render the scenery in that region singularly interesting. Beyond these the

principal feature is the great confluence of waters at the outlet of the Columbia river, and the bold shores of the Pacific ocean.

The principal *rivers* of the United States are the St. Lawrence and its waters, the Columbia and its waters, the St. Francisco, the Rio del Norte, and the Missouri and Mississippi, and the waters that flow into them. The river St. Lawrence is formed by the waters that are collected about lake Superior, from which they issue into lake Huron through the straits of St. Mary, and from it, by the straits of that name about forty miles long, into lake St. Clair. From this lake the waters pass into lake Erie, through the straits of Detroit, an important and beautiful passage, about 30 miles long. (See DETROIT.) Between Buffalo on one side and Fort Erie on the other, the water is discharged from the lake, and by a rapid course runs towards lake Ontario, through the passage called Niagara river. About five miles below lake Erie, the stream is divided by Grand island, below which is Navy island, where it expands to a considerable breadth, above the falls of *Niagara;* which see. Below the falls the river runs very rapidly for nine miles, through a deep chasm, and is navigable to lake Ontario, a distance of seven miles. From lake Ontario the river issues through a great number of islands, situated between Kingston and Sackett's Harbour. Here it assumes the name of St. Lawrence, though from the lake to Montreal it is frequently denominated Cadaraqui. In its progress it expands into a considerable lake, called St. Francis; and when it reaches Montreal, it receives the Utawas, or Grand river, which forms the boundary between the two Canadas. Below Montreal, it receives the Richelieu, or Sorel river, from lake Champlain, and in succession the St. Francis, St. Maurice, and Chaudiere, below which, at a small distance, stands Quebec, and below this city the river is divided into two branches by the island of Orleans. Beyond this island it gradually expands into the spacious bay and gulf of St. Lawrence, which communicates with the ocean by the straits of Belleisle, and what is called the South Entrance. See *St.* LAWRENCE.

Columbia river is supposed to take its rise about 300 miles N.E. of the point at which it interlocks with the head waters of the Unjigah or Peace river. It was first discovered by the enterprising British traveller, Mr. M'Kenzie, in N. lat. 54° 40'. W. long. 120° 25', from London; and he descended it about 150 miles, and then leaving it, traversed the country to the ocean. From the point where he left it, its course is unknown till it is joined by Clark's river, where it is a large stream. About seventy miles below Clark's river, after receiving some tributary streams, the Columbia forms a junction with Lewis's river, formed of many branches, which rise in the Rocky mountains, where, like Clark's river, they interlock with the head waters of the Missouri. Below Lewis's river, the Columbia bends to the S. and E., and then passes through the mountains; and about 300 miles below are the Great Falls. About twenty miles below the falls, the river makes a considerable bend, and passes through another chain of mountains; below which, about 60 miles, it receives from the S.E. the large and important river called the Multnomah. From the Multnomah, supposed to rise near the head waters of the Rio del Norte, to the ocean, which is a distance of about 90 miles, it is all tide-water, through good land, with many Indian settlements. The waters of the Columbia are clear, and abound with every variety of fish.

The *St. Francisco* river is a very large stream, 270 miles in the interior of the country; a part of it being formed by the Rio Buenaventura, and its waters, which interlock with the waters of the Rio del Norte and La Platte, and opening, in process of time, an excellent communication with the settlements on the W. coast of America.

The *Rio del Norte* rises among the mountains between N. lat. 44° and 42°, and 33° and 34° W. long. Its head waters interlock with those of the Missouri, Columbia, La Platte, Arkansas, Multnomah, and Francisco: and the waters of the Rio Colorado of the west, which fall into the gulf of California, approach near it. In a progress of about 300 miles to the point where the traveller Pike and his party first encamped upon it, it is presumed to be the S.W. boundary of Louisiana. About 100 miles below this is Santa Fé, an interesting Spanish settlement: below Santa Fé, the river runs about 450 miles in a direction E. of S., without any material augmentation, when the Rio Conchos falls into it from the S.W. Below this it makes a bend of about 100 miles, and receives the Rio Puerco from the N. At this river the Rio del Norte again becomes the S.W. boundary of Louisiana. Below this it pursues an E. course of between 50 and 60 miles, when it receives a considerable stream from the N.; and from hence, without much increase, its course is nearly S.E., about 400 miles, to the gulf of Mexico. See RIO.

The Missouri and Mississippi, with their numerous branches, water the interior of the United States. The highest source of the *Missouri* (which see) lies on Jefferson's river, a little above the 44th degree of latitude, and near the 35th degree of W. longitude, 3000 miles from the Mississippi. From this point, in descending it, we arrive in succession at Philanthropy river, Wisdom river, Philosophy river, Madison's river, Gallatin's river, Ordway river, Dearborn's river, and Smith's river, and then reach the falls of the Missouri, which are perpendicular descents, and partly rapids, the river falling no less than 365 feet in the course of 18 miles. The highest pitch is 87 feet, the next 47, and the next 26. Passing the falls, we arrive at Portage river, Snow river, Maria's river, Stone-wall creek, Slaughter river, Big Horn river, Judith river, Turtle creek, Windsor creek, North Mountain creek, others of less note, Bralton's creek, Milk creek, Porcupine creek, and Martha's creek, and then come to the Yellowstone river, which flows in from the S.W. The Yellowstone is a large river, the main branch of which rises in lake Eustus, and after receiving numerous tributary streams, the Big Horn, a river nearly equal to it in size, which rises in lake Biddle, falls in from the southward; and the streams thus united and augmented by others, particularly the Tongue river, form a confluence with the Missouri, in N. lat. 48°. W. long. 27°. Beyond this, at a small distance, the Missouri reaches its northern extremity in N. lat. 48° 22', where it receives the White-earth river, and beyond this the head waters of the Moose river approach within one mile of the main stream of the Missouri. Below this, the river is augmented by the Little Missouri, and after passing the Knife river, we arrive at Fort Mandan. Between 43° and 44°, there is a great bend in the river; and below it the river receives a number of pretty large streams, before we reach the La Platte, a little above N. lat. 41°. This is a very large stream, extending through several ridges of the rocky mountains, the head waters of which are higher than either the Arkansas or Rio del Norte. Passing the La Platte, the Missouri receives many tributary streams, before it reaches the Kanses, a large river, which falls in from the W., a little above the 39th degree of N. lat. Below this it is augmented by some important streams from the N., and afterwards the beautiful Osage river falls in from the S.W. Below this river, about 120 miles, the Missouri joins the Mississippi, above St. Louis; from whence the united streams flow with majestic rapidity to the ocean.

The

The *Mississippi* (which see) rises, says Mr. Melish, in Turtle lake, N. lat. 47° 47', and after receiving several tributary streams, reaches the falls of St. Anthony in N. lat. 44°, which falls are 16 feet perpendicular, with a rapid below of 58 feet. Below the falls, St. Peter's river forms a junction with the Mississippi from the W., and a little further, St. Croix river falls in from the E. About 15 miles below this, the river spreads out into a beautiful sheet of water, called lake Pepin, at the lower end of which it receives the waters of the Chippeway river. About 90 miles below this river, the Ouisconsin falls in from the eastward, which river approaches within 1¾ mile of the Fox river, which falls into lake Michigan. At the mouth of the Ouisconsin river is Prairie du Chien, where the United States have lately formed a military establishment, which will undoubtedly be very important to the settlements of this part of the country. After passing the Ouisconsin river, the Mississippi makes a considerable bend to the eastward, and meets the northern boundary of the Illinois territory; then bending westward about 30 miles, it receives Stony river. About 80 or 90 miles below this, the Riviere des Moines falls in from the westward, and then the Illinois falls in from the eastward, a little above the junction of the Mississippi and the Missouri. The Illinois is a large river, the head waters of which interlock so closely with those falling into lake Michigan, that canoes, it is said, have sometimes in the wet season passed from the one to the other. About 12 miles below the confluence of the Illinois with the Mississippi, we arrive at the junction of the Mississippi and Missouri: the former of which is, according to Mr. Melish, inferior in importance to the latter. The Missouri, he says, is the main stream, and the Mississippi only a tributary branch. The former is in length double the latter, and receives before its junction with it, the waters of many streams, one of which, the La Platte, is longer than the Mississippi. The Arkansas and Red river are also much longer; and the Ohio, allowing for its great bends, is also longer; and taken in connection with the Cumberland and Tennassee, is a river of much greater importance.

After leaving St. Louis, we pass along the Mississippi about 80 miles to Kaskaskia, where the Kaskaskia, a considerable stream, falls in from the eastward; and about 90 miles further below this, the Ohio river, augmented by its numerous branches, joins the Mississippi. About 350 miles below the Ohio, the White river, a beautiful stream, falls in from the westward: 14 miles below this river, the Arkansas, a very large and important river, having its sources in the mountains above Santa Fé, falls in from the westward. Below the Arkansas river, 190 miles, the Yazoo falls in from the eastward: the Big Black river also falls into the Mississippi 63 miles by water, but only 30 in a direct line by land, below the Yazoo. A few miles below this, we pass the 31st degree of N. lat., which forms the boundary between the state of Louisiana and the Mississippi territory; after which the river bends to the westward, and receives the waters of the Red river. The Red river rises in the mountains, E. of Santa Fé, between 37° and 38° of N. lat., and pursuing mostly a S.E. course, makes several bends, and receives no considerable streams until it joins the Wachitta, and its great mass of waters, a few miles before it reaches the Mississippi. The latter passes to the sea by New Orleans and the Red river, through the Atchafalaya. As this river receives no streams of importance after passing the Atchafalaya, it may be considered as having reached its maximum; and it may be viewed in its progress from hence to the ocean, as having an average breadth of 800 yards, its depth about 120 feet, and the velocity of its current about one mile *per* hour. Accordingly, it runs on with majestic sway, and passes St. Francisville, Baton-Rouge, Donaldsonville, Manchac, and, 250 miles below the Atchafalaya, reaches New Orleans, where it makes a considerable bend to the S. and E. After passing the English Turn, a considerable bend in the river, 16 miles below New Orleans, situated on its northern bank, we next meet fort St. Philip, or Placquemines, distant 54 miles. Below this, at the interval of 19 miles, the river separates into three grand divisions, *viz.* the South-east or Main Pass, the South Pass, and the South-west Pass. Four miles below the Forks, on the Main Pass, a stream issues to the N.E., called Pass à la Loutre, and the Main Pass is divided into two parts at the outlet, one called the North and the other the South-east Pass. The South-west Pass is also divided into two parts at the outlet; the western one being called the West Pass. On all these passes there are bars at the outlet, with the water comparatively shallow: the Main Pass has about 13 feet; the South-west Pass 12; the West Pass 9; and the South Pass 8. The course of the river may be traced to a considerable distance from the shore, when it is finally lost in the mass of waters forming the gulf of Mexico.

Mr. Darby, in his valuable work on Louisiana, has given the following calculation of the quantity of water discharged by the Mississippi. In one foot longitudinal section of the river, it is estimated that there are 141,372 cubic feet of water, the mean velocity being one mile *per* hour; and as the mile contains 5280 feet, the river will of course discharge 5280 times 141,372, or 746,444,160 cubic feet of water every hour. This being reduced to gallons, gives 4,573,938,000, being upwards of 76 millions of gallons in a minute, and of 1270 thousand gallons in every second of time. The magnitude and importance of this river are exhibited by Mr. Melish in another point of view, thus: the eastern extremity of the waters of this river is the head waters of the Allegany, which are situated in Pennsylvania, about 190 miles N.W. of Philadelphia: the western extremity is the head waters of Jefferson's river, about 540 miles from the Pacific ocean; and the distance between these two extremities, in a direct line, is about 1700 miles. The northern extremity is a branch of the Missouri, in 50° 42' N. lat., 550 miles W. by N. of the Lake of the Woods: the southern extremity is the south pass into the gulf of Mexico, 29° N. lat., 90 miles below New Orleans; and the distance between these two extremities, in a direct line, is 1680 miles. Hence it appears, by a subjoined statement, that the river and its branches spread over nearly 1,500,000 square miles, or above two-thirds of the whole territory of the United States.

The *lakes* of the United States are some of the largest in the world. The principal of these lie in a chain along their northern boundary, upon the Canada line, and are, lakes Superior, Michigan, Huron, St. Clair, Erie, Ontario, Champlain, George, Memphremagog, Umbagog, Chilmacook, and Moosehead, &c. &c. The chief of these are described under their appropriate names, and others under the account of the states to which they belong.

Of the minerals, soil, produce, and climate of the United States, it is needless to give in this place more than a general statement, as they are mentioned under the appellations of the respective states and territories to which they pertain.

As to *minerals*, iron, lime-stone, and free-stone abound through the country. Coal is plentiful in the western territories, and is found in several districts in the Atlantic states. Lead abounds in the district near St. Louis, where the mines are extensive and valuable. Copper mines are also found in several places, and it is said that gold and silver, in great profusion, exist in Upper Louisiana. In this province marble

ble is abundant, and forms the bed of the White river for 300 miles. In the neighbourhood of Philadelphia, and in other places, the benefit derived from the marble quarries is very confiderable. Quickfilver, zinc, faltpetre, and fulphur, are plentiful. Upper Louifiana affords great quantities of antimony, and the whole weftern territory abounds with falt-fprings. The foil in this extenfive country is various. On the Atlantic coaft, to the N. and E., it is ftony, and towards the S. fandy; but in both fituations, intermixed with much allavial land. Towards the mountains the foil improves, and is in many places very fertile. On the mountains it is light and thin, but in the valleys rich. Beyond the mountains, in the valleys of Ohio, Miffiffippi, and Miffouri, feveral tracts of land are exceedingly rich and fertile. Towards the S.W. parts of the Miffouri territory, the foil is light, thin, and fandy. The mountainous region to the N.W. is fimilar to the Allegany mountains, but the hills are more lofty, and the foil more variable. Beyond thefe mountains there is much good foil, as far as the Pacific ocean.

The *produce* confifts of every variety that can be named; wheat, maize, rye, oats, barley, rice, and other grain; apples, pears, cherries, peaches, grapes, currants, goofeberries, plums, and other fruit, and a vaft variety of vegetables. Lemons, oranges, and fome other tropical fruits, are raifed in Louifiana and fome of the other fouthern countries. Hops, flax, and hemp are abundant. Tobacco is an article of extenfive cultivation in Virginia, Maryland, and other diftricts. Cotton is a ftaple commodity in the fouthern ftates. Indigo is produced in Louifiana, and fugar is a commodity much cultivated in that country, and in fome places along the Atlantic coaft. The northern and eaftern ftates, and the mountains in the interior, are fine grazing countries, and furnifh a great number of cattle and fheep, and abundance of butter and cheefe. The Merino breed of fheep have been introduced, and are faid to thrive as well as they do in Spain. Horfes for draught and faddle abound, and fome of them are excellent, particularly in Pennfylvania. Other domeftic animals, as affes, goats, hogs and dogs, are plentiful. Of tame fowl, the United States have turkeys, geefe, ducks, common poultry, pigeons, peacocks, and guinea fowls. The wild animals are numerous; among which may be enumerated the bifon or wild ox, moofe, deer, bear, wolf, fox, lynx, panther, weafel, ermine, martin, mink, otter, opoffum, hare, fquirrel, moufe, bat, rat, beaver, feal, &c. The game and wild fowl peculiar to the country are turkeys, pheafants, partridges, woodcocks, fnipes, wild fwans, wild geefe, wild ducks, pigeons, teal, plovers, widgeons, rail, &c. The other birds are eagles, hawks, vultures, turkey-buzzards, ftarlings, blue birds, red birds, humming-birds, &c. Of fifhes, thefe ftates have the whale, dolphin, porpoife, grampus, fkate, fhark, fturgeon, cod, flounder, perch, whiting, falmon, trout, roach, fhad, drum, black fifh, and many others, with which the feas, interior lakes, and rivers abound. Among the amphibious reptiles we may reckon the tortoife, frog, lizards of various fpecies, the alligator, &c. To the clafs of ferpents belong the fnakes and vipers, which abound in the United States. Of natural timber the United States have various kinds; but fome of the moft ufeful are the elm, cherry, locuft, oak, beech, pine, cedar, cyprefs, willow, hickory, afh, walnut, chefnut, birch, maple, &c.

The *climate* muft vary in the different parts of the United States. In the N.E. parts the winters are very cold, and the fummers hot, changing as you proceed fouthward. In the S.E. and along the gulf of Mexico, the fummers are very hot, and the winters mild and pleafant. Among the mountains it is cold towards the N., and temperate in the S. Beyond the mountains, in the rich valleys of Ohio, Miffiffippi, and Miffouri, the climate is temperate and delightful, till we approach the Rocky mountains, when it is fubject to extremes, the winters being very cold. The climate muft be chilled among mountains conftantly covered with fnow. Weft of thefe mountains the climate changes, until we reach the fhores of the Pacific ocean, where it refembles that of the weftern parts of Europe. The prevailing winds are from the weft, and as they pafs over a wide expanfe of water, they cool the air in fummer, and in winter deluge the country with frequent rain.

The *hiftory* of the United States has been already given, during the rife and progrefs, and to the termination of that difpute which feparated them from this country, under AMERICA. From the time of their firft fettlement to July 1776, they continued to be Britifh colonies; but in that month Congrefs declared them to be *independent* ftates. At this period their number was thirteen, and they contained about three millions of inhabitants. Since that time they have increafed in an aftonifhing degree, and now amount to nineteen ftates, and five territories, containing, by the cenfus of 1810, 7,239,903 inhabitants: and it is faid by Melifh (1816) that about 253,400 may be added as the annual increafe fince that year. This writer obferves, that the progrefs of agriculture, manufactures, and the mechanic arts, is more remarkable than that of the population. At the period of the revolution the fettlements were almoft wholly confined to the eaftward of the mountains, and principally along the fea-board, depending on Britain for manufactures, and many of the neceffaries of life. The fettlements now extend acrofs the Miffiffippi, the interior being ftudded with towns, villages, and farm-houfes; and abounding with grift-mills, fulling-mills, carding and roving machines, paper-mills, cotton-mills, iron founderies and forges, tan-works, glafs-works, in fuch profufion, and increafing fo rapidly, that the internal manufactures will foon be fufficient not only to fupply the demand at home, but to furnifh vaft quantities of cotton yarn and cloth, and of hemp articles, for exportation. The eftimated amount of manufactures in 1810, was 120,000,000 dollars. The increafe fince that time has been fo great, that they may be now eftimated at upwards of 200,000,000. The United States have heretofore exported flour, wheat, Indian corn, rice, afhes, cotton, indigo, tobacco, timber, fifh, live-ftock, tar, turpentine, &c. In 1812, the amount was 45,294,043 dollars. They have imported dry goods, groceries, tea, coffee, fugar, wine, brandy, &c. In 1812, the amount of the imports was nearly equal to the exports. The ftate of commerce, it is faid, is rapidly changing from external to internal trade.

The *government* of the United States is a federal republic. Each ftate has a conftitution for the management of its internal affairs, and they are all formed into one united body by the "federal conftitution." By this conftitution the legiflative power is vefted in a congrefs of delegates from the feveral ftates, divided into two diftinct bodies, the "fenate," and "houfe of reprefentatives." The members of the latter are elected every two years by the people, and the fenators are elected every fix years by the ftate legiflatures. The executive power is vefted in a *prefident* (which fee), chofen every four years, by a number of delegates in each ftate, appointed in fuch manner as the ftate legiflatures may direct, and equal to the number of members which they refpectively fend to both branches of congrefs. The conftitution guarantees for ever freedom of fpeech and liberty of the prefs. In the eye of the law all the inhabitants are equal. All muft bear arms, or pay an equivalent; and all are equally interefted in the defence of the country. The military ftrength of the country is a well-difciplined militia; and here is alfo an increafing

creaſing navy, to the maintenance of which the fiſhing trade is peculiarly important. Trial by jury is to be preſerved inviolate. A republican form of government is guaranteed to all the ſtates, and hereditary titles and diſtinctions are prohibited.

With regard to the *religion* of the United States, it is ſtipulated that no law ſhall ever be paſſed to eſtabliſh any particular form of religion, or to prevent the free exerciſe of it: and no religious teſt ſhall be required as a qualification to any office of public truſt under the United States. The following denominations of Chriſtians are more or leſs numerous; *viz.* Congregationaliſts, Preſbyterians, Epiſcopalians, Dutch reformed church, Baptiſts, Quakers or Friends, Methodiſts, Roman Catholics, German Lutherans, German Calviniſts, Moravians, or brethren of the epiſcopal church. The Congregationaliſts are ſaid to be the moſt numerous, particularly in New England, and alſo in the middle and ſouthern ſtates. Next to theſe are the Preſbyterians, who inhabit chiefly the middle and ſouthern ſtates, and they are united under the ſame conſtitution. In 1796 theſe were divided into five ſynods, *viz.* thoſe of New York, Philadelphia, Virginia, Carolinas, each of which four meet annually: and beſides, they have a joint meeting, by their commiſſioners, once a year, in general aſſembly at Philadelphia. The Preſbyterian churches are governed by congregational, preſbyterial, and ſynodical aſſemblies; but theſe aſſemblies poſſeſs no civil juriſdiction. The Dutch reformed churches maintain the doctrine of the ſynod of Dort, held in 1618, and conſtitute ſix claſſes, which form one ſynod, ſtyled "the Dutch reformed Synod of New York and New Jerſey." The claſſes conſiſt of miniſters and ruling elders; each claſs delegating two miniſters and an elder, to repreſent them in ſynod. The number of Proteſtant epiſcopal churches is not aſcertained. There are ſome in New England, but they are moſt numerous in the ſouthern ſtates. The Baptiſts are chiefly upon the Calviniſtic plan as to doctrines, and Independents as to church government and diſcipline. The Friends or Quakers went to America about the year 1656; the firſt ſettlers of Pennſylvania being of this deſcription. The Methodiſts are Arminian and Calviniſtic. The Roman Catholics are principally ſettled in Maryland, where they have a biſhop. The German inhabitants in theſe ſtates principally belong to Pennſylvania and New York, and are divided into a variety of ſects, the principal of which are Lutherans, Calviniſts, Moravians, Tunkers, and Mennonites. But the German Lutherans are the moſt numerous. The Moravians are diſperſed over Pennſylvania, at Bethlehem, Nazareth, and Litiz; and they have alſo other ſettlements in New Jerſey, North Carolina, Rhode iſland, New York, &c. The Tunkers appeared in 1719, and landing in Philadelphia, diſperſed themſelves in various parts of Pennſylvania; they are General Baptiſts, and believe in univerſal redemption and ſalvation. Their principal ſettlement is at Ephrata, called Tunker's-town, in Lancaſter county. The Mennonites are chiefly ſettled in Pennſylvania. The Univerſaliſts, who maintain the doctrine of the ultimate ſalvation of all men, are ſaid not to be numerous. The Unitarians are an increaſing body. The Shakers form a ſmall body. There are ſome few Jews, and many Deiſts. Proviſion is made for education and the improvement of the mind throughout the United States.

Accounts in the United States were formerly kept in pounds, ſhillings, and pence currency, which practice is ſtill retained on ſome occaſions; but the value of the currency is not the ſame in different ſtates.

In Pennſylvania, New Jerſey, Delaware, and Maryland, the ratio of currency to ſterling is as 3 to 5: and therefore 1*l.* ſterling = 1*l.* 13*s.* 4*d.* currency; or 1*l.* currency = 12*s.* ſterling.

In New Hampſhire, Maſſachuſetts, Connecticut, Rhode Iſland, and Virginia, the ratio is as 3 to 4; and therefore 1*l.* ſterling = 1*l.* 6*s.* 8*d.* currency; or 1*l.* currency = 15*s.* ſterling.

In New York and North Carolina, the ratio is as 9 to 16; and therefore 1*l.* ſterling = 1*l.* 15*s.* $6\frac{2}{3}$*d.* currency; or 1*l.* currency = 11*s.* 3*d.* ſterling.

In South Carolina and Georgia, the ratio is as 27 to 28; and therefore 1*l.* ſterling = 1*l.* 0*s.* $8\frac{8}{9}$*d.* currency; or 1*l.* currency = 19*s.* $3\frac{3}{7}$*d.* ſterling.

Hence the exchange between England and the United States is at par, when, for every 100*l.* ſterling, Pennſylvania, Maryland, &c. give 166*l.* 13*s.* 4*d.* currency; New England and Virginia, 133*l.* 6*s.* 8*d.* do.; New York and North Carolina, 177*l.* 15*s.* $6\frac{2}{3}$*d.* do.; Georgia and South Carolina, 103*l.* 14*s.* $0\frac{8}{9}$*d.*

Moſt of the European coins paſs in the United States, but Spaniſh dollars are moſt common: hence the value of other European monies is commonly expreſſed in dollars, and hundredth parts of a dollar, called cents.

The dollar is valued in the different ſtates according to the currency of each place. Thus in Pennſylvania, Maryland, Delaware, and Jerſey, it paſſes for 7*s.* 6*d.*; in New England and Virginia, for 6*s.*; in New York and North Carolina, for 8*s.*; in South Carolina and Georgia, for 4*s.* 8*d.*

An uniform way of keeping accounts has been eſtabliſhed in the United States (by an act of Congreſs in 1789) namely, in dollars of 10 dimes, 100 cents, or 1000 mills; and this method is uſed in all public accounts.

The American government, at the ſame time, eſtabliſhed a mint, and ordered money to be coined, in gold, ſilver, and copper, according to the following denominations and values; *viz.*

Eagles, each to be of the value of 10 dollars, or units, and to contain $247\frac{4}{8}$ grains of pure, or 270 grains of ſtandard, gold, the ſtandard being 22 carats, or $\frac{11}{12}$ fine. Its intrinſic value in Engliſh gold is, therefore, 2*l.* 3*s.* 8*d.* nearly. Half eagles and quarter eagles were alſo ordered to be coined in the ſame proportion.

Dollars or units, each to be of the value of a Spaniſh milled dollar, and to contain $371\frac{1}{4}$ grains of pure, or 416 grains of ſtandard, ſilver, the ſtandard being $\frac{1485}{1664}$ fine, or 10 oz. 14 dwts. nearly. Its intrinſic value in Engliſh ſilver is, therefore, 4*s.* $3\frac{3}{4}$*d.* nearly. Half dollars, quarter dollars, dimes, or tenths of dollars, and half dimes, were alſo ordered to be coined in the ſame proportion. Hence the proportion of gold to ſilver is as 4160 to 270, or as $15\frac{11}{27}$ to 1.

Cents, each to be of the value of the one-hundredth part of a dollar, and to contain 208 grains of copper. Half cents were ordered to be coined in the ſame proportion.

The remedy of the mint is one part in 144.

In the public bank eſtabliſhed at Philadelphia in 1790, chartered by Congreſs, and empowered to appoint branch-banks in the different ſtates, the capital was fixed at ten millions of dollars, and divided into 25,000 ſhares, of 400 dollars each; none of the ſubſcribers were to hold more than 1000 ſhares; one-fourth of the ſubſcription was to be paid in ſpecie, and three-fourths in public ſtock. Theſe ſhares are transferrable, and yield a dividend, payable half yearly, of 7 or 8 *per cent. per ann.* The conſtitution and government of this bank are nearly on the plan of the bank of England.

The bank diſcounts, at 6 *per cent per ann.*, bills and notes that have no more than 65 days to run; the three days of grace are included, and diſcount allowed for them. Bills or

or notes intended to be offered for difcount muft be delivered at the bank on the preceding day, inclofed under a cover, and directed to the cafhier, mentioning the name of the holder of the bill.

Money depofited in the bank may be drawn out again at pleafure, free of expence; but no money is paid to any perfon beyond the balance of his account.

Other banks have been eftablifhed in Philadelphia, as well as in Bofton, New York, Baltimore, Alexandria, and Charleftown, fome of which were prior to the bank of Philadelphia, called the "United States' Bank;" but they are chartered only by their refpective ftates. Kelly's Cambift.

The United States comprife three grand divifions: denominated *Northern*, or more properly *Eaftern*, *Middle*, and *Southern* ftates.

The firft divifion (the Northern or Eaftern States) comprehends

Vermont,
New Hampfhire,
Diftrict of Maine,
(belonging to Maffachufetts)
Maffachufetts Proper,
Rhode Ifland,
Connecticut.

Thefe are called the New England States, and comprehend that part of America which, fince the year 1614, has been known by the name of New England.

The fecond divifion (the Middle States) comprehends

New York,
New Jerfey,
Pennfylvania,
Delaware,
Ohio,
Indiana Territory,
Michigan Territory.

The third divifion (the Southern States) comprehends

Maryland,
Virginia,
Kentucky,
North Carolina,
Tenneffee,
South Carolina,
Georgia,
Miffiffippi Territory.

To which we may now add Louifiana.

The ftates, diftricts, and tetritories of the United States are defcribed under their appropriate appellations: but the area, extent, population, chief towns, &c. of each, are exhibited in one view of them in the following

Topographical Table.

States and Territories.	Medium. Length. N. and S.	Medium. Breadth E. and W.	Area in Square Miles.	Population laft Cenfus.	Seat of Government.	Memb. to Congrefs.
Maine - - -	216	162	31,750	228,705	Portland } -	20
Maffachufetts - -	70	140	8,500	472,040	Bofton }	
New Hampfhire - -	160	70	8,500	214,460	Concord -	6
Vermont - - -	152	60	8,700	217,895	Montpellier -	6
Rhode Ifland - -	48	42	1,500	76,931	Providence -	2
Connecticut - -	50	80	4,000	261,942	Hartford -	7
New York - - -	198	256	46,000	959,049	Albany -	27
New Jerfey - - -	138	50	6,600	245,5[illegible]	Trenton -	6
Pennfylvania - -	153	273	42,500	810,091	Harrifburg -	23
Delaware - - -	90	25	1,700	72,674	Dover - -	2
Maryland - - -	108	198	10,800	380,546	Annapolis -	9
Virginia - - -	220	370	64,000	974,622	Richmond -	23
Ohio - - - -	204	210	39,000	230,760	Columbus -	6
Kentucky - - -	138	300	39,000	406,511	Frankfort -	10
Tenneffee - - -	102	420	40,000	261,727	Nafhville -	6
North Carolina - -	120	345	45,000	555,500	Raleigh - -	15
South Carolina - -	162	216	28,700	415,115	Columbia -	9
Georgia - - -	300	240	58,000	252,433	Milledgeville -	6
Louifiana - - -	240	210	48,000	76,556	New Orleans -	1
Indiana - - -	240	138	34,000	24,520	Corydon* -	0
Diftrict of Columbia -	10	10	100	24,023	Wafhington -	0
Miffiffippi Territory -	312	324	89,000	40,352	Wafhington -	0
Illinois Territory - -	306	210	50,000	12,282	Kafkafkia -	0
Michigan Territory -	234	138	27,000	4,762	Detroit - -	0
North-weft Territory -	360	456	147,000			
Miffouri Territory -	1380	1680	1,580,000	20,845	St. Louis	0
			2,459,350	7,239,903		182
				Each ftate fends two fenators		36
					Total legiflature	218

* Indiana is about to be conftituted into a ftate, when it will fend two fenators, and one reprefentative.

From

From this table it appears, that if we refer the district of Maine to Massachusetts, and admit Indiana, the number of states is now nineteen; of districts, two; and of territories, four. Their respective topographical tables, extracted from Mr. Melish's valuable publication, appear either in the sequel of this article, or under the appellation to which we refer.

The district of *Maine*, according to the statement of Melish, is situated between 43° 5′ and 47° 45′ N. lat., and 5° 55′ and 10° E. long. from Washington; extending from N. to S. about 216 miles, from E. to W. 162, and comprehending about 31,750 square miles, or 19,720,000 acres. For other particulars, see MAINE.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Cumberland	24	42,831	PORTLAND	7,169
Hancock	76	30,031	Castine	1,036
Kennebeck	33	32,564	Hallowell	2,068
Lincoln	36	42,992	Wiscasset	2,083
Oxford	37	17,630	Paris.	
Somerset	37	12,910	Norridgewock	880
Washington	24	7,870	Machias	1,570
York	21	41,877	York	3,046
	288	228,705		

The state of *Massachusetts* is situated between 41° 13′ and 42° 52′ N. lat., and 3° 20′ and 6° 55′ E. long. from Washington, extending from N. to S. 70 miles, from E. to W. 140 miles, and comprehending 8500 square miles, or 5,440,000 acres. See MASSACHUSETTS.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Barnstaple	14	22,211	Barnstaple.	
Berkshire	32	35,907	Stockbridge	1,261
Bristol	16	37,168	Taunton.	
Duke's	3	3,290	Edgarton	1,365
Essex	23	71,888	Salem	12,612
			Newbury Port	1,634
Franklin.*				
Hampden.*				
Hampshire	64	76,275	Springfield	2,767
Middlesex	44	52,789	Concord	1,633
Nantucket	1	6,807	Sherburne.	
Norfolk	22	31,245	Dedham	2,172
Plymouth	18	35,169	Plymouth	4,228
Suffolk	2	34,381	BOSTON	33,250
Worcester	51	64,910	Worcester	2,577
	290	472,040		

* Laid out since last census.

The state of *New Hampshire* is situated between 42° 42′ and 45° 13′ N. lat., and 4° 23′ and 6° 10′ E. long. from Washington; extending from N. to S. 160 miles, from E. to W. 70, and comprehending 8500 square miles, or 5,440,000 acres. See HAMPSHIRE.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Cheshire	35	40,988	Keene tp.	1,646
Coos	24	3,991	Lancaster tp.	717
Grafton	35	28,462	Haverhill tp.	1,105
Hillsborough	42	49,249	Amherst tp.	1,554
Rockingham	46	50,175	CONCORD tp.	2,393
			Portsmouth	6,934
			Exeter tp.	1,759
Strafford	31	41,595	Dover tp.	2,288
	213	214,460		

For an account of the state of *Vermont*, see VERMONT.

The state of *Rhode Island* is situated between 41° 22′ and 42° N. lat., and 5° and 5° 50′ E. long. from Washington; extending from N. to S. 48 miles, from E. to W. 42, and comprehending 1500 square miles, or 960,000 acres. See RHODE *Island*.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Bristol	3	5,972	Bristol	2,692
Kent	4	9,834	Warwick.	
Newport	7	16,294	NEWPORT	7,907
Providence	10	30,769	PROVIDENCE	10,071
Washington	7	14,962	S. Kingston.	
	31	76,931		

The state of *Connecticut* is situated between 41° and 42° N. lat., and 3° 20′ and 5° E. long. from Washington; extending from N. to S. 50 miles, from E. to W. 80, and comprehending 4000 square miles, or 2,560,000 acres. See CONNECTICUT.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Fairfield	17	40,950	Fairfield.	
Hartford	18	44,733	HARTFORD	3,995
Litchfield	22	41,375	Litchfield.	
Middlesex	7	20,723	Middletown	2,014
New Haven	17	37,064	NEWHAVEN	5,772
New London	13	34,737	New London	3,238
Tolland	10	13,779	Tolland	1,638
Windham	15	28,611	Windham	500
	119	261,942		

For an account of the state of *New York*, see NEW YORK.

The state of *New Jersey* is situated between 38° 56′ and 41° 20′ N. lat., and 1° 33′ and 3° 5′ E. long. from Washington; extending 138 miles in length and 50 miles in breadth, and comprehending 6600 square miles, or 4,224,000 acres. See *New* JERSEY.

Topo-

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Bergen	7	16,603	Hackenfack tp.	1,958
Burlington	12	24,979	Burlington tp.	2,419
Cape May	3	3,632	C.H.	
Cumberland	8	12,670	Bridgetown.	
Effex	10	25,984	Newark tp.	8,008
Gloucefter	10	19,744	Gloucefter tp.	1,726
Hunterdon	10	24,553	TRENTON tp.	3,002
Middlefex	8	20,381	N. Brunfwick tp.	6,312
Monmouth	7	22,150	Freehold tp.	4,784
Morris	10	21,828	Morriftown tp.	3,753
Salem	9	12,761	Salem	929
Somerfet	7	14,728	Boundbrook.	
Suffex	15	25,549	Newtown tp.	2,082
	116	245,562		

The ftate of *Pennfylvania* is fituated between 39° 43′ and 42° N. lat., and 2° 20′ E. and 3° 30′ W. long. from Wafhington; extending from N. to S. 153 miles, from E. to W. 273, and comprehending 24,500 fquare miles, or 27,200,000 acres. See PENNSYLVANIA.

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Adams	18	15,152	Gettyfburg.	
Alleghany	15	25,317	Pittfburg	4,768
Armftrong	7	6,143	Kitaning	309
Beaver	12	12,168	Beaver	426
Bedford	15	15,746	Bedford	547
Berks	33	43,146	Reading tp.	3,462
Bradford.*				
Bucks	29	32,371	Newton	790
Butler	13	7,346	Butler tp.	458
Cambria	3	2,117	Ebenfburg	75
Centre	11	10,681	Bellefont	303
Chefter	40	39,596	Weft Chefter	471
Clearfield	1	875	Clearfield tp.	875
Columbia.*				
Crawford	14	6,178	Meadville	457
Cumberland	18	26,757	Carlifle	2,491
Dauphin	15	31,883	HARRISBURG tp.	2,287
Delaware	21	14,734	Chefter	1,056
Erie	14	3,758	Erie	394
Fayette	19	24,714	Union	999
Franklin	14	23,083	Chamberfburg	2,000
Greene	10	12,544	Greene tp.	1,708
Huntingdon	18	14,778	Huntingdon	676
Indiana	7	6,214	Indiana	200
Jefferfon	1	161	Jefferfon tp.	161
Lancafter	25	53,927	Lancafter	5,405
Lebanon.*				
Lehigh.*				
Luzerne	29	18,109	Wilkefbarre	1,225
Lycoming	18	11,006	Williamsport	344
M'Kean	1	142	Smethport.	
Mercer	16	8,277	Mercer.	
Mifflin	9	12,132	Lewiftown	474
Montgomery	30	29,703	Norriftown	1,336
Northampton	32	38,145	Eafton.	
Northumberl.	26	36,327	Northumberl. tp.	627
Philadelphia	18	111,200	Philadel. City	92,866
			Do. County	18,344
Carry up	551	694,440		
Brought up	551	694,440		
Potter	1	29	Cowdersport.	
Pike*	1		Milford	83
Schuylkill.*				
Somerfet	15	11,284	Somerfet	489
Sufquehanna.*				
Tioga	2	1,687	Wellfborough.	
Union.*				
Venango	8	3,060	Franklin	159
Warren	2	827	Warren.	
Wafhington	23	36,289	Wafhington	1,301
Wayne	12	4,125	Bethany.	
Weftmoreland	14	26,392	Greenfburg	685
York	22	31,958	York	2,847
	651	810,091		

* Laid out fince laft cenfus.

The ftate of *Delaware* is fituated between 38° 29′ and 39° 48′ N. lat., and 1° 18′ and 1° 58′ E. long. from Wafhington; extending from N. to S. 90 miles, from E. to W. 25, and comprehending about 1700 fquare miles, or 1,088,000 acres. See DELAWARE.

Topographical Table.

Counties.	Hundreds.	Population.	Chief Towns.	
Kent	5	20,495	DOVER	800
New Caftle	9	24,429	Wilmington	4,406
Suffex	11	27,750	Georgetown	400
	25	72,674		

The ftate of *Maryland* is fituated between 38° and 39° 43′ N. lat., and 2° E. and 2° 30′ W. long. from Wafhington; extending from N. to S. 90 miles, from E. to W. 198, and comprehending 10,800 fquare miles, or 6,912,000 acres. See MARYLAND.

Topographical Table.

Counties.	Population.	Chief Towns.	
Alleghany -	6,909	Cumberland.	
Ann Arundel -	26,668	ANNAPOLIS	2,000
Baltimore -	29,255	Baltimore -	46,556
Ditto City -	35,583		
E. precincts of do.	4,050		
W. do. - -	6,922		
Cecil - -	13,066	Elkton.	
Calvert - -	8,005	St. Leonard's.	
Caroline - -	9,458	Denton.	
Charles - -	20,245	Port Tobacco.	
Dorchefter -	18,108	Cambridge.	
Frederick -	34,437	Fredericktown	4,500
Harford - -	21,258	Harford.	
Kent - -	11,450	Chefter.	
Montgomery -	17,980	Unity.	
Prince George -	20,589	Marlborough.	
Queen Ann's -	16,648	Centreville.	
St. Mary's -	12,794	Leonard T.	
Somerfet - -	17,195	Princefs Ann.	
Talbot - -	14,230	Eafton.	
Wafhington -	18,730	Elizabeth-town.	
Worcefter -	16,971	Snow Hill.	
	380,546		

For an account of the diſtrict of *Columbia*, ſee Territory, Columbia, and Washington.

For an account of the ſtate of *Virginia*, ſee Virginia.

The ſtate of *Ohio* is ſituated between 38° 30′ and 42° N. lat., and 3° 32′ and 7° 40′ W. long. from Waſhington; extending from N. to S. 204 miles, and from E. to W. 210, and comprehending about 39,000 ſquare miles, or 24,960,000 acres. See Ohio.

Topographical Table.

Counties.	Townſhips.	Population.	Chief Towns.	
Adams	9	9,434	Weſt Union	224
Aſhtabula.*			Jefferſon.	
Athens	4	2,791	Athens tp.	840
Belmont	11	11,097	St. Clairſville.	
Butler	9	11,150	Hamilton.	
Cayahoga	4	1,459	Cleveland tp.	547
Champaign	9	6,303	Urbanna.	
Clark.*			Greenville.	
Clermont	8	9,965	Williamſburg tp.	1,251
Clinton	3	2,674	Wilmington.	
Columbiana	17	10,878	New Liſbon.	
Coſhocton.*			Coſhocton.	
Dark.*				
Delaware	7	2,000	Delaware.	
Erie.*				
Fairfield	15	11,361	New Lancaſter.	
Fayette	4	1,854	Waſhington.	
Franklin	8	3,486	Franklinton tp.	916
			Columbus	448
Gallia	12	4,181	Gallipolis.	
Geauga	8	2,917	Chardon.	
Guernſey	9	3,051	Cambridge.	
Green	6	5,870	Zenia tp.	1,429
Hamilton	11	15,258	Cincinnati tp.	2,540
Harriſon.*				
Highland	7	5,766	Hillſborough.	
Huron.*				
Jefferſon	15	17,260	Steubenville tp.	1,617
Johnſon.*				
Knox	5	2,149	Mount Vernon.	
Licking	7	3,852	Newark tp.	539
Madiſon	6	1,603	New London.	
Medina.*				
Miami	6	3,941	Troy.	
Monroe.*				
Montgomery	7	7,722	Dayton tp.	1,746
Muſkingum	11	10,036	Zaneſville tp.	2,154
Pickaway	10	7,124	Circleville.	
Portage	9	2,995	Ravenna.	
Preble	7	3,304	Eaton.	
Richland.*			Mansfield.	
Roſs	16	15,514	Chillicothe tp.	1,369
Scioto	9	3,399	Portſmouth.	
Stark	7	2,734	Canton tp.	846
Trumbull	19	8,671	Warren tp.	875
Tuſcarawa		3,045	New Philadelphia.	
Warren	5	9,925	Lebanon.	
Waſhington	12	5,991	Marietta tp.	1,463
Wayne.*			Wooſter.	
	320	230,760		

* Laid out ſince the laſt cenſus.

The ſtate of *Kentucky* is ſituated between 36° 30′ and 39° 5′ N. lat., and 4° 48′ and 12° 20′ W. long. from Waſhington; extending from N. to S. 138 miles, from E. to W. 300, and comprehending 39,000 ſquare miles, or 24,960,000 acres. See Kentucky.

Topographical Table.

Counties.	Population.	Chief Towns.	
Adair	6,011	Columbia	175
Barren	11,286	Glaſgow	244
Bath.*			
Boone	3,608		
Bracken	3,451	Auguſta	255
Breckenridge	3,430		
Bourbon	18,009	Paris	838
Butler	2,181		
Bullet	4,311		
Clarke	11,519	Wincheſter	538
Caſey	3,285	Liberty	33
Campbell	3,060	Newport	413
Chriſtian	11,020	Hopkinſonville	131
Cumberland	6,191	Burkeſville	106
Clay	2,398		
Caldwell	4,268		
Eſtill	2,082		
Fayette	21,370	Lexington	4,326
Franklin	8,013	Frankfort	1,099
Fleming	8,947		
Floyd	3,485	Preſtonville	32
Gallatin	3,307	Port William	120
Greenup	2,369		
Green	6,735	Greenſburg	132
Grayſon	2,301		
Garrard	9,186	Lancaſter	260
Henry	6,777	Newcaſtle	125
Harriſon	7,752	Cynthiana	369
Henderſon	4,703	Henderſon	159
Harden	7,531	Elizabeth Town	181
Hopkins	2,964	Madiſonville	37
Jeſſamine	8,377	Nicholaſville	158
Jefferſon	13,399	Louiſville	1,357
Knox	5,875	Barbourſville	55
Lexington.*			
Livingſton	3,674	Smithland	99
Lewis	2,357		
Lincoln	8,676		
Logan	12,123	Ruſſelville	532
Maſon	12,459	Waſhington	815
Mercer	12,630	Danville	432
Madiſon	15,540	Richmond	366
Muhlenburg	4,181	Greenville	75
Montgomery	12,975	Mountſterling	325
Nicholas	4,898		
Nelſon	14,078	Beardſtown	821
Ohio	3,682	Hartford	110
Pulaſki	6,897		
Pendleton	3,061	Falmouth	121
Rockcaſtle	1,731		
Scott	12,419	Georgetown	529
Shelby	14,837	Shelbyville	424
Union.*			
Wayne	5,430	Monticello	37
Waſhington	13,248	Springfield	249
Warren	11,937	Bowling-green	154
Woodford	9,659	Verſailles	488
	406,511		

* Laid out ſince the laſt cenſus was taken.

For

For an account of the ſtate of *Tenneſſee*, ſee TENNESSEE.

The ſtate of *North Carolina* is ſituated between 33° 45′ and 36° 30′ N. lat., and 1° E. and 6° 50′ W. long. from Waſhington; extending from N. to S. 120 miles, and from E. to W. 345, and comprehending 45,000 ſquare miles, or 28,800,000 acres. See *North* CAROLINA.

Topographical Table.

Counties.	Population.	Chief Towns.	
Anſon - -	8,831	Wadeſborough.	
Aſh - -	3,694		
Beaufort -	7,203	Waſhington -	600
Bertie - -	11,218	Windſor.	
Bladen - -	5,671	Elizabethtown.	
Brunſwick -	4,778	Brunſwick.	
Buncombe -	9,277	Aſhville.	
Burke - -	11,007	Morgantown.	
Cabarras -	6,158	Concord.	
Camden -	5,347	Joneſburg.	
Carteret -	4,823	Beauford.	
Caſwell - -	11,757	Leaſburg.	
Chatham -	12,977	Pittſborough.	
Chowan -	5,297	Edenton -	1,500
Columbus -	3,022	Whiteſville.	
Craven - -	12,676	Newbern -	2,467
Cumberland -	9,382	Fayetteville -	1,800
Currituck -	6,985	Indiantown.	
Duplin - -	7,863	Sarecto.	
Edgecomb -	12,423	Tarborough	600
Franklin -	10,166	Louiſburg.	
Gates - -	5,965	C. H.	
Granville -	15,576	Williamſborough.	
Green - -	4,867	C. H.	
Guilford -	11,420	Martinville -	300
Halifax - -	15,620	Halifax.	
Haywood -	2,780		
Hertford -	6,052	Wynton.	
Hyde - -	6,029	Germantown.	
Iredel - -	10,972	Stateſville.	
Johnſon -	6,867	Smithfield.	
Jones - -	4,968	Trenton.	
Lenoir - -	5,572	Kington.	
Lincoln - -	16,359	Lincolnton.	
Martin - -	5,987	Williamſton.	
Mecklinburg -	14,272	Charlotte.	
Moore - -	6,367	Alfordſtown.	
Montgomery -	8,430	Henderſon.	
Naſh - -	7,268	C. H.	
New Hanover	11,465	Wilmington.	1,689
Northampton -	13,082	C. H.	
Onſlow - -	6,669	Swanſborough.	
Orange - -	20,135	Hillſborough.	
Paſquotank -	7,674	Nixonton.	
Perſon - -	6,642	Roxboro'.	
Pitt - -	9,169	Greenville.	
Perquimans -	6,052	Hartford.	
Randolph -	10,112	C. H.	
Richmond -	6,695	Rockingham.	
Robeſon -	7,528	Lumberton -	208
Rockingham -	10,316	Danbury.	
Rowan - -	21,543	Saliſbury -	500
Rutherford -	13,202	Rutherfordton.	
Sampſon -	6,620	C. H.	
Carry up	480,830		
Brought up	480,830		
Stokes - -	11,645	Upper Sara.	
Surry - -	10,366	Salem - -	700
Tyrrel - -	3,364	Elizabethtown.	
Wake - -	17,086	RALEIGH -	1,000
Warren - -	11,004	Warrenton -	300
Waſhington -	3,464	Plymouth.	
Wayne - -	8,687	Wayneſboro'.	
Wilkes - -	9,054	Wilkes C. H.	
	555,500		

The ſtate of *South Carolina* is ſituated between 32° 6′ and 35° N. lat., and 1° 30′ and 6° 25′ W. long. from Waſhington; extending from N. to S. 162 miles, from E. to W. 216, and comprehending 28,700 ſquare miles, or 18,368,000 acres. See *South* CAROLINA.

Topographical Table.

Diſtricts.	Population.	Chief Towns.	
Abbeville -	21,150	Abbeville.	
All Saints.*			
Barnwell -	12,280		
Beaufort -	25,887	Beaufort -	1,000
Charleſton city	24,711		
Charleſton diſtrict	38,468		
Cheſter - -	11,479	Cheſter.	
Cheſterfield -	5,564		
Claremont.*			
Clarendon.*			
Colleton	26,359		
Darlington	9,047		
Edgefield -	23,160		
Fairfield -	11,857	Fairfield.	
Georgetown -	15,679	Georgetown -	2,000
Greenville -	13,133	Greenville.	
Horry - -	4,349		
Kerſhaw -	9,867	Camden -	1,000
Lancaſter -	6,318		
Laurens -	14,982	Laurens.	
Lexington -	6,641		
Liberty.*			
Marion.*			
Marlborough -	4,966	Marlborough.	
Maſon - -	8,884		
Newbury -	13,964	Newbury.	
Orange - -	13,229	Orangeburg.	
Pendleton .	22,897	Pendleton.	
Pinckney.*			
Richland -	9,027	COLUMBIA -	1,500
Spartan - .	14,259	Spartanburg.	
St. Peters.*			
Sumpter -	19,054	Stateſburg.	
Union - -	10,995	Union.	
Williamſburg -	6,871	Williamſburg.	
York -	10,052	York.	
	415,115		

* Laid out ſince the laſt cenſus.

The

The ſtate of *Georgia* is ſituated between 30° 30′ and 35° N. lat., and 3° 50′ and 9° 5′ W. long. from Waſhington; extending from N. to S. 300 miles, and from E. to W. 240, and comprehending about 58,000 ſquare miles, or 37,120,000 acres. See GEORGIA.

Topographical Table.

Counties.	Population.	Chief Towns.	
Baldwin - -	6,356	MILLEDGEVILLE,	1257
Bryan - -	2,827	C. H.	
Bullock - -	2,305	Stateſburgh	
Burke - -	10,858	Wayneſborough	224
Camden - -	3,941	St. Mary's -	585
Chatham -	13,540	Savannah -	5,215
Clarke - -	7,628	Athens - -	273
Columbia -	11,242	Applington.	
Effingham -	2,586	Ebenezer -	19
Elbert - -	12,156	Peterſburg -	3 32
Emanuel.*			
Franklin -	10,815	Carneſville -	78
Glynn - -	3,417	Brunſwick.	
Greene - -	11,679	Greenſborough	411
Hancock -	13,330	Sparta - -	317
Jackſon - -	10,569	Jefferſonton -	70
Jaſper - -	7,573	Monticello -	220
Jefferſon -	6,111	Louiſville -	524
Jones - -	8,597	Clinton - -	85
Laurens - -	2,210	Dublin.	
Liberty - -	6,228	Riceboro'.	
Lincoln - -	4,555	Lincolnton -	108
Madiſon.*		Danielſville.	
M'Intoſh -	3,739	Darien - -	206
Montgomery -	2,954	C. H.	
Morgan - -	8,369	Madiſon - -	229
Oglethorpe -	12,297	Lexington -	222
Pulaſki - -	2,093	Hartford.	
Putnam - -	10,029	Eatonton -	180
Richmond -	6,189	Auguſta - -	2,476
Scriven - -	4,477	Jackſonborough	20
Tattnal - -	2,206	C. H.	
Telfair - -	744	C. H.	
Twiggs - -	3,405	Marion.	
Walton - -	1,026		
Warren - -	8,725	Warrenton -	123
Waſhington -	9,940	Saunderſville	
Wayne - -	676	C. H.	
Wilkes - -	14,887	Waſhington -	596
Wilkinſon -	2,154	Irwinton.	
	254,433		

* Laid out ſince the laſt cenſus.

The ſtate of *Louiſiana* is ſituated between 29° and 33° N. lat., and 12° and 17° W. long. from Waſhington; extending from N. to S. 240 miles, from E. to W. 210, and comprehending 48,000 ſquare miles, or 30,540,000 acres. See LOUISIANA.

Topographical Table.

Pariſhes.	Population.	Chief Towns.	
Aſcenſion -	2,219	Donaldſonville -	200
Aſſumption -	2,472		
Avoyelles -	1,109		
Baton Rouge Weſt	1,463		
Concordia -	2,875	Concordia -	200
Iberville -	2,679		
Interior of La Fourche	1,995		
Natchitoches -	2,870	Natchitoches -	600
Ouachitta -	1,077		
Ocatahoola -	1,164		
Orleans -	24,552	NEW ORLEANS	17,242
Plaquemines -	1,549		
Point Coupee	4,539		
Rapides - -	2,300	Alexandria -	300
St. Bernard -	1,020		
St. Charles -	3,291		
St. John Baptiſte	2,990		
St. James -	3,955		
St. Landre Opeloufas -	5,048	Opeloufas -	150
St. Mary's and St. Martin's Attacapas - -	7,369	St. Martin's -	150
	76,556		
Add the four Pariſhes from the Miſſiſſippi Territory.			
Baton Rouge E. New Feliciana St. Helena St. Tammany	10,000	Baton Rouge - 800; St. Franciſville 400; Springfield - 150; C. H.	
	86,556		

The ſtate of Louiſiana is divided into twenty-five pariſhes, whoſe natural poſitions are, ſix north of 31° N. lat.; three ſouth of 31° N. lat. and weſt of Atchafalaya river; and ſixteen eaſt of Atchafalaya. Their reſpective extent in ſquare miles, and population in 1810, is exhibited by the following table.

Statiftical TABLE of the Extent of the Parifhes of the State of Louifiana, and their Population in 1810.

Parifhes.	Square Miles.	Acres.	Arpents.	Population in 1810.
Plaquemines	1,500	960,000	1,134,300	1,549
Orleans	1,300	832,000	983,060	24,552
St. Bernard	400	256,000	302,480	1,020
St. Charles	300	192,000	226,860	3,291
St. John Baptifte	150	96,000	113,430	2,990
St. James	170	108,800	128,554	3,955
Afcenfion	350	224,000	264,670	2,219
Affumption	500	320,000	378,100	2,472
Interior of La Fourche	2,500	1,600,000	1,890,500	1,995
Iberville	350	224,000	264,670	2,679
Weft Baton Rouge	850	544,000	642,770	1,463
Point Coupée	600	384,000	453,720	4,539
St. Mary's and St. Martin's Attacapas	5,100	3,264,000	3,856,620	7,369
St. Landré, Opeloufas	7,600	4,864,000	5,747,120	5,048
Natchitoches	10,600	6,784,000	8,015,720	2,870
Ouachitta	4,000	2,560,000	3,024,800	1,077
Rapides	2,300	1,472,000	1,739,260	2,300
Ocatahoola	2,000	1,280,000	1,512,400	1,164
Concordia	2,100	1,344,000	1,588,020	2,875
Avoyelles	700	448,000	529,340	1,109
New Feliciana	1,050	672,000	794,010	10,000
Eaft Baton Rouge	500	320,000	378,000	
St. Helena	1,300	832,000	983,060	
St. Tammany	2,000	1,280,000	1,512,400	
	48,220	30,860,800	36,463,964	86,556

For an account of the ftate of *Indiana*, fee TERRITORY and INDIANA.

For an account of the *Miffiffippi Territory*, fee TERRITORY and MISSISSIPPI.

For the *Illinois Territory*, fee TERRITORY and ILLINOIS.

For the *North-Weft Territory*, fee TERRITORY.

For the *Miffouri Territory*, fee TERRITORY and MISSOURI.

For the *Michigan Territory*, fee TERRITORY and DETROIT.

The territory of *Orleans* comprehends the county of Orleans, the German coaft, Acadia, Lafourche, Iberville, Point Coupee, Concordia, Ouachitta, Rapides, Natchitoches, Opeloufas, and Attacapan; and by the cenfus of 1810, its whole population confifted of 76,556 perfons. (See ORLEANS and LOUISIANA). Melifh's Geographical Defcription of the United States. Philadelphia. 1816. Morfe's Geography.

To the preceding general account of the United States, the Editor fubjoins the pleafing information with which he is furnifhed by the 13th report of the Britifh and Foreign Bible Society (1817), that 130, or upwards, of fuch focieties have been eftablifhed in thefe States, among which are numerous female inftitutions: and that, in confequence of a convention of delegates from different Bible focieties, held in the city of New York, in May 1816, a fociety was inftituted under the name of "The American Bible Society," of which the fole object fhould be to encourage a wider circulation of the Holy Scriptures, without note or comment. Several of the American focieties have received pecuniary aid from the Britifh and Foreign Bible Society.

UNITED *States' Saline*, a townfhip of the Illinois territory, in the county of Randolph, containing 845 inhabitants.

UNITY, UNITAS, the abftract, or quality, which conftitutes, or denominates a thing *unum*, or one.

The fchool philofophers generally define unity, by a thing's being undivided in itfelf, and divided from every thing elfe. Others, more accurately, define it, a mode of being, by which it agrees to any particular being, once: thefe make two kinds of unity, *viz.* *unity of fimplicity*, which is both undivided and indivifible; fuch as that of God, angels, and human fouls: the other, *union of compofition*, which, though undivided, is divifible in the being, as confifting of divers parts; fuch is that of man, &c.

Hence, unity is alfo divided into that *per fe*, which agrees to any being whofe parts are collected into one fubftratum: and unity *per accidens*, whofe parts are not united into one fubftratum, as that of a flock of fheep, &c.

Some alfo make a *fingular*, or *numerical* unity, andan *univerfal* unity; a *real*, and an *imaginary* unity, &c.

It is difputed among mathematicians, whether or not unity be a number? The generality of authors hold the negative, and make unity to be only inceptive of number, or the principle of it; as a point is of magnitude, and an unifon of concord.

Stevinus is very angry with the maintainers of this opinion: and yet, if number be defined a multitude of units joined together, as many authors define it, it is evident that unity is not itfelf a number.

It is to be obferved in algebra, that unity itfelf has three different expreffions of its cube root, one real, and the other two impoffible, or imaginary. Thus the three cube roots of 1, are 1, $\frac{-1+\sqrt{-3}}{2}$, and $\frac{-1-\sqrt{-3}}{2}$.

This is fometimes of ufe in finding the cube roots of quantities, appearing under impoffible expreffions.

The two impossible expressions of the $\sqrt[3]{1}$ may be thus found: let $x = 1$, then $x^3 = 1$, or $x^3 - 1 = 0$, and $x - 1 = 0$. Divide $x^3 - 1$ by $x - 1$, the quotient is $xx + x + 1 = 0$, or $xx + x = -1$. Resolve this quadratic equation, by adding $\frac{1}{4}$ to both sides. Then $xx + x + \frac{1}{4} = -\frac{3}{4}$, and extracting the square root, $x + \frac{1}{2} = \sqrt{-\frac{3}{4}} = \frac{\sqrt{-3}}{2}$. Therefore $x = -\frac{1}{2} + \sqrt{-\frac{3}{4}} = \frac{-1 \pm \sqrt{-3}}{2}$. That is, $x = \frac{-1 + \sqrt{-3}}{2}$, and $x = \frac{-1 - \sqrt{-3}}{2}$. See Maclaurin's Algebra, p. 128. 226.

Unity, among *Divines*. The Romanists, and the reformed, dispute, whether or not the church be one single body, all the members of which are joined together, either really, or in inclination; so that whatever does not appertain to that body, is no part of the church; which is what they call the *unity of the church;* and which the Romanists maintain to be restrained to one single society, or one communion, under one visible head; and out of which the Protestants are excluded. These last, on the contrary, hold, that the unity of the church may still subsist, without the members being united under any one visible head; it being sufficient, that all Christians be united by the bonds of mutual love and charity; and that they be agreed in the fundamental points of religion.

All the difficulty is, to fix what those fundamentals are; some inclining to make the door of the church wider than others. See Uniformity.

Unity, in *Poetry*. In the drama there are three unities to be observed; the unity of *action*, that of *time*, and that of *place*.

In the epic poem, the great and almost only unity is that of the action. Some regard, indeed, ought to be had to that of time: but that of place there is no room for. The unity of character is not reckoned among the unities.

The unity of the dramatic action consists in the unity of the intrigue in comedy, and that of the danger in tragedy; and this not only in the plan of the fable, but also in the fable extended and filled with episodes.

The episodes are to be worked in, without corrupting the unity, or forming a double action; and the several members are to be so connected together, as to be consistent with that continuity of action so necessary to the body; and which Horace prescribes, when he says, "sit quodvis simplex duntaxat et unum."

The unity of the epic action, M. Dacier observes, does not consist in the unity of the hero, or in the unity of his character and manners; though those be circumstances necessary to it. The *unity of action* requires, that there be but one principal action, of which all the rest are to be incidents, or dependencies.

F. Bossu assigns three things requisite to it: the first, that no episode be used, but what is fetched from the plan and ground of the action, and which is a natural member of that body: the second, that these episodes and members be well connected with each other: the third is, not to finish any episode, so as it may appear a whole action; but to let each be always seen in its quality of member of the body, and an unfinished part.

The same excellent critic examines the Æneid, Iliad, and Odyssey, with respect to these rules, and finds them strictly observed. Indeed, it was from the conduct of those divine poems, that he took the hint of the rules themselves. Instances in which these rules are all neglected, he gives us in Statius's Thebaid.

To the *unity of time*, it is required, in the drama, that the action be included in the space of a day. Aristotle says expressly, it must not exceed the time the sun employs in making one revolution, which is a natural day, under pain of irregularity: some critics will even have it included in the space of twelve hours, or an artificial day.

Indeed, the ancient tragic poets sometimes dispensed with this rule; and many of the modern English ones disallow it: and very few of them practise it.

In the epic poem, the unity of time is still less established. In effect, there is no fixing the time of its duration; in regard, the warmer and more violent the action is, the less must be its continuance; whence it is, that the Iliad, representing the anger of Achilles, only contains forty-seven days at most; whereas the action of the Odyssey holds eight years and a half, and that of the Æneid almost seven years.

But the length of the poem Aristotle gives us a rule for; which is, that it be such as that it may be read over in one day: pretending, that if it exceeds that compass, the imagination will be bewildered in it, and that one cannot see the end, without having lost the idea of the beginning.

As to the *unity of place* and *scene*, neither Horace nor Aristotle give us any rules relating to them. It were to be wished, indeed, that what is presented to the audience on the same stage, which is never shifted, might be supposed to have passed in the same house, and the same apartment. But as such a constraint would cramp the poet too much; and as such an uniformity would suit very ill with abundance of subjects; it has been agreed, that what passes any where in the same town or city, shall be allowed for unity of place. At least, if two different places be unavoidable; yet the place is never to be changed in the same act.

Shakspeare, it is well known, paid no regard to the unities of time and place. On this subject Dr. Johnson observes, in the preface to his edition of Shakspeare's plays, that perhaps a nearer view of the principles on which they stand will diminish their value, and withdraw from them the veneration which, from the time of Corneille, they have very generally received, by discovering that they have given more trouble to the poet than pleasure to the auditor.

As nothing is essential to the fable but unity of action, and as the unities of time and place arise evidently from false assumptions, and by circumscribing the extent of the drama, lessens its variety, Dr. Johnson does not think we need much lament their not being known or not observed by Shakspeare.

He adds, as the result of his enquiries, that the unities of time and place are not essential to a just drama; that though they may sometimes conduce to pleasure, they are always to be sacrificed to the nobler beauties of variety and instruction; and that a play written with nice observations of critical rules, is to be contemplated as an elaborate curiosity, as the product of superfluous and ostentatious art, by which is shewn rather what is possible than what is necessary.

He that, without diminution of any other excellence, shall preserve all the unities unbroken, deserves the like applause with the architect, who shall display all the orders of architecture in a citadel, without any deduction from its strength; but the principal beauty of a citadel is to exclude the enemy; and the greatest graces of a play are to copy nature and instruct life.

Unity *of Possession*, in *Law*, signifies a joint possession of two rights, by several titles.

Thus, if I take a leafe of land upon a certain rent, and afterwards buy the fee fimple; this is an unity of poffeffion, by which the leafe is extinguifhed: by reafon I, who before had only the occupation for my rent, am now become lord of the fame, and am to pay rent to none but myfelf.

Unity of poffeffion amounts to the fame with what civilians called *confolidation;* which fee.

The unity of a joint eftate is fourfold, *viz.* unity of intereft, the unity of title, the unity of time, and the unity of poffeffion; or, in other words, joint-tenants have one and the fame intereft, accruing by one and the fame conveyance, commencing at one and the fame time, and held by one and the fame undivided poffeffion. See Blackft. Com. b. ii.

Unity *of a Sentence*, in *Grammar* and *Rhetoric.* See Style.

Unity *of Melody*. This is an ingenious idea, which we think merits a place among mufical defiderata: it was firft fuggefted and recommended by Rouffeau, in his Letter on French Mufic, 1751, and afterwards enforced in his Mufical Dictionary, in the following manner. "There is in all the fine arts fome object of unity, or fymmetry, the fource of intellectual pleafure: for attention divided by two different objects, has no repofe; and when two objects occupy us at once, it is a proof that the mind is fatisfied with neither. (Baretti ufed to fay that two misfortunes were better than one, beccaufe they divided the attention.) There is in mufic a fucceffive unity with refpect to the fubject, by which all the parts well combined conftitute a whole, whence we perceive the *enfemble* and all its relations.

"But there is another more refined and more fimultaneous object of unity, whence there infenfibly arifes the energy of mufic and force of its expreffions.

"When I hear our pfalms fung in four parts, I begin to liften with great delight at the full and nervous harmony; and the firft chords, when they are perfectly in tune, affect me even to fhivering; but before I have liftened many minutes to the reft, my attention diminifhes, till by degrees I am ftunned with the noife; I become indifferent, and, at length, tired with hearing nothing but chords.

"This does not happen when I hear good modern mufic, though the harmony is not fo vigorous; and I remember at the opera in Venice, a beautiful air well executed never tired me, whatever was its length; and if repeated, my attention was renewed, and I heard it with more intereft the fecond time than the firft.

"This difference arifes from the character of the two mufics, of which one is only a fucceffion of chords, and the other a feries of fingle founds in melody. Now the pleafure which we receive from harmony, is only that of pure fenfation, and the enjoyment of the fenfes is always fhort. Satiety and fatigue follow each other very clofely; but the pleafure from melody, is an interefting pleafure of fentiment which fpeaks to the heart, and which an artift may always fuftain and renew by force of genius.

"Mufic ought therefore neceffarily to fing, in order to intereft, pleafe, and fupport the attention. But in our fyftems of chords and mere harmony, can mufic fing, or have any interefting melody? If each part has its own melody, all thefe melodies heard at once, mutually deftroy each other, and annihilate all melody: if all the parts perform the fame melody, we fhall have no harmony, and the concert will be wholly in unifon.

"The manner in which a mufical inftinct, a certain impulfe of genius, has vanquifhed this difficulty without feeing it, and at the fame time turned it to advantage, is very remarkable. Harmony, which, abufed, would fuffocate melody, animates, enforces, and gives it a character: the different parts, judicioufly arranged, concur in producing the fame effect, and though each feems to have a melody of its own, from all thefe parts united, we hear only one and the fame melody. This is what I call *unity of melody*.

"Let us now explain how harmony itfelf, far from injuring, concurs in fupporting this unity. Our melodies are characterifed by our keys and meafures, and our keys are governed by harmony. Whenever the harmony enforces and determines the fentiment of the mode or key and the modulation, it adds to the expreffion of the melody, provided it does not cover and render it infignificant.

"The compofer's art, therefore, after rendering himfelf a mafter of harmony and modulation, fhould be principally pointed to the unity of melody. 1. When the key is not fufficiently determined in the melody, to render it more certain by the harmony. 2. To felect and ufe his chords in fuch a manner, that the moft interefting found fhould be always in the principal melody, and that its intereft fhould arife from the bafe. 3. To add to the energy of each paffage by harfh chords, if the expreffion is harfh, and by pleafing chords, if the expreffion is fweet. 4. To pay attention in the ftyle of the accompaniment to the piano and forte of the melody: and 5. To contrive that the melody of the parts of accompaniment do not counteract the principal, but fuftain, fecond, and give it a more lively and marked accent.

"The unity of melody particularly requires that two melodies equally interefting fhould not be heard at the fame time, but not that the melody fhould never pafs from one part to another. (In the quartets of Haydn, Mozart and Pleyel, there is nothing more amufing to the hearers, or more flattering to the performers, than giving the melody alternately to the different parts, in the way of dialogue.) But a treatife would be neceffary to fhew in detail the application of this principle to duos, trios, quartets, chorufes, and fymphonies. Men of genius will difcover its extent and ufe, and their works will inftruct others. I therefore conclude by afferting, upon the principle which I have been trying to eftablifh; firft, that all mufic which does not fing is tirefome, in whatever harmony it may be clothed; fecondly, that all mufic in which many different fimultaneous parts are diftinguifhed, is bad, and that there refults from it the fame effect as from two or more people fpeaking upon different fubjects at the fame time. From this opinion, which admits of no exception, will be pointed out what we ought to think of thofe wonderful compofitions, where one air ferves for an accompaniment to another.

"It is from this principle of the unity of melody, which the Italians have felt and followed without knowing it, but which the French have neither known nor followed; it is, I repeat it, from this grand principle, that the effential difference of the two mufics arifes; and it is, I believe, what every impartial judge will allow, who fhall liften to both with equal attention, if however that is poffible."

Unity, in *Geography*, a town of America, in the diftrict of Maine and county of Kennebeck, containing 793 inhabitants; 60 miles N. of Brunfwick.—Alfo, a town of New Hampfhire, in the county of Chefhire, containing 1044 inhabitants: N.E. of Charleftown.—Alfo, a townfhip of Pennfylvania, in Weftmoreland county, containing 2174 inhabitants.—Alfo, a townfhip of Ohio, in the county of Columbiana, containing 827 inhabitants.

Unity *Bay*, a bay on the E. coaft of Labrador. N. lat. 57° 8′. W. long. 61° 30′.

UNIVALVE, in *Conchology*, a genus of fhells. See Conchology and Shells.

UNIVERSAL, something that is common to many things; or, it is one thing belonging to many, or all things.

The word, according to some, is compounded of *unum versus alia*.

There are universal instruments, for measuring all kinds of distances, as heights, lengths, &c. called also *pantometers* and *holometers*.

An universal dial is that by which the hour may be found by the sun all over the earth; or under any elevation of the pole. See *Universal* DIAL.

Several learned authors have had it in view to establish an universal character; by which the different nations might understand each other's writings, without learning their language. See *Universal* CHARACTER.

The Romanists are divided among themselves about the title of *universal bishop*, which some of the popes have arrogated to themselves; though others of them have declined it. Baronius holds the appellation to belong to the pope *jure divino;* and yet St. Gregory, opposing the same quality given by a council in 586 to John, patriarch of Constantinople, asserted expressly, that it did not belong to any bishop; and that the bishops of Rome neither could, nor ought to take it. Accordingly, St. Leo refused to accept it, when offered him by the council of Chalcedon; for fear, lest, giving something particular to one bishop, they should take from all the rest; since there could not be an universal bishop, but the authority of the rest must be diminished.

UNIVERSAL, *Universale*, in *Logic*, is either *complex* or *incomplex*. A *complex* universal, is either an universal proposition, as, "Every whole is greater than its parts;" or whatever raises a manifold conception in the mind; as the definition of a reasonable animal.

An *incomplex* universal, is what produces one only conception in the mind, and is a simple thing, respecting many; as human nature, which relates to every individual in which it is found.

Now in an universal, two things are distinguished; the *matter*, called the *material universal, universale materiale*, which is the one nature multipliable into many; as humanity in Peter, Paul, &c.; and the *form*, called the *formal universal*, which is the unity of that nature.

Wherefore, to constitute an universal, it is requisite the nature be one, yet multipliable; but what such a nature is has proved matter of great controversy, both among the ancient and modern philosophers.

The Platonists will have universals to be nothing but divine ideas. By idea, they mean the pattern or form which the artificer has in view when he makes any thing; but as this is twofold; *internal*, which is a sort of image of the thing to be done, which the artificer frames in himself; and *external*, which is something out of himself, which the artificer imitates; the philosophers have been infinitely perplexed to find which of the two Plato meant. The Peripatetics insist he meant the *external;* but the Platonists, and most of the Christian divines, were advocates for the *internal*.

The Peripatetic system of species and phantasms, as well as the Platonic system of ideas, is grounded, says Dr. Reid, in his reasoning against the ideal theory (see IDEA), upon this principle, that in every kind of thought, there must be some object that really exists; in every operation of the will, something to work upon. Whether this immediate object be called an idea with Plato, or a phantasm or species with Aristotle; whether it be eternal and uncreated, or produced by the impressions of external objects, is, as he thinks, of no consequence in the present argument.

The Stoics and Nominalists maintain this in common with the Platonists, that universals are not in the things themselves, but out of them. The Stoics particularly, for universals, put a kind of formal conceptions, or acts of knowing; by reason they represent many things at the same time; *e. g.* knowledge, representing all men, is, according to the Stoics, an universal.

The Nominalists make words universals; because the same word represents many things, as the word *man* represents all men; but both Stoics and Nominalists make universals to be something extrinsic to things themselves; alleging that whatever exists, or is produced, is singular; so that there is no universal really in things. See NOMINALS and REALISTS.

The Peripatetics, however, contend, that there are universal and common natures in things themselves; or that things and natures like each other form a material universal. But as to the manner in which they are universal, or whence they derive their universality, that is, their unity and aptitude of being in many, whether from nature, or from our understanding, is great matter of dispute among them. If they derive that unity in which their universal form is placed from nature, then there is an universal *à parte rei;* which is the opinion of the Scotists.

If they do not derive it from nature, but only from our minds or understandings, then the doctrine of the Thomists is allowed, who contend, that a formal universal has no other existence, but by an act of the intellect.

"As in all the ancient metaphysical systems," says the ingenious professor Dugald Stewart, "it was taken for granted, that every exertion of thought implies the existence of an object distinct from the thinking being; it naturally occurred, as a curious question, What is the immediate object of our attention, when we are engaged in any general speculation? or, in other words, what is the nature of the idea corresponding to a general term?"—"In answer to this question," says the professor, "the Platonists, and, at an earlier period, the Pythagoreans, taught, that although these universal ideas are not copied from any objects perceivable by sense, yet that they have an existence independent of the human mind, and are no more to be confounded with the understanding, of which they are the proper objects, than material things are to be confounded with our powers of external perception: that as all the individuals which compose a genus, must possess something in common; and as it is in consequence of this, that they belong to that genus, and are distinguished by that name, the common thing forms the essence of each; and is the object of the understanding, when we reason concerning the genus. They maintained also, that this common essence, notwithstanding its inseparable union with a multitude of different individuals, is in itself one and indivisible." Our author substitutes the term *essence* for *idea*, as more intelligible to the modern reader, and more suited to convey the true import of Plato's expressions. (See ESSENCE.) On most of these points, the philosophy of Aristotle very nearly agreed with that of Plato; though they used different language in developing their respective opinions. Plato, fond of the marvellous and mysterious, maintained the incomprehensible union of the same idea or essence, with a number of individuals, without multiplication or division. Aristotle, aiming at greater perspicuity, contented himself with saying, that all individuals are composed of matter and form; and that in consequence of possessing a common form, different individuals belong to the same genus. "But they both agreed, that, as the matter, or the individual natures of objects were perceived by sense; so the general idea, or essence, or

or form, was perceived by the intellect; and that, as the attention of the vulgar was chiefly engrossed with the former, so the latter furnished to the philosopher the materials of his speculations.

"The chief difference between the opinions of Plato and Aristotle on the subject of ideas, related to the mode of their existence. That the matter of which all things are made, existed from eternity, was a principle which both admitted; but Plato farther taught, that, of every species of things, there is an idea or form which also existed from eternity; and that this idea is the exemplar or model according to which the individuals of the species were made; whereas Aristotle held, that, although matter may exist without form, yet that forms could not exist without matter.

"The doctrine of the Stoics concerning universals, differed widely from those both of Plato and Aristotle, and seems to have approached to a speculation which is commonly supposed to be of a more recent origin, and which an eminent philosopher of the present age has ranked among the discoveries which do the greatest honour to modern genius." See Hume's Treatise of Human Nature, book i. part i. sect. 7.

Our author's preceding statement of Aristotle's doctrine, as far as it is commonly supposed to differ from that of Plato, is founded on the authority of Brucker, whom we have cited under the appropriate titles; though Harris, in his "Hermes," and the author of the "Origin and Progress of Language," give a different account of the difference subsisting between them.

The opinion which generally prevailed among the Scholastics in the dark ages was, "that universals do not exist *before* things, nor *after* things, but *in* things; that is, universal ideas have not (as Plato thought) an existence separable from individual objects; and, therefore, they could not have existed prior to them in the order of time; nor yet, (according to the doctrine of the Stoics,) are they mere conceptions of the mind, formed in consequence of an examination and comparison of particulars; but these ideas or forms are from eternity united inseparably with that matter of which things consist; or, as the Aristotelians sometimes express themselves, the forms of things are from eternity immersed in matter."

This opinion concerning the nature of universals was generally maintained till the eleventh century, when a new doctrine, borrowed from the school of Zeno, was proposed by Roscelinus, and propagated by Abelard. According to these philosophers, there are no existences in nature corresponding to general terms, and the objects of our attention in all our general speculations, are not ideas, but words. The Scholastics from this time formed themselves into two sects, *viz.* the Nominalists and Realists: the former attaching itself to the opinions of Roscelinus and Abelard, and the latter to the principles of Aristotle. See Nominals and Realists.

Our author's opinion coincides with that of the Nominalists; and from his elaborate statement of the process of the mind, in pursuing general speculations, he infers, "that idea, which the ancient philosophers considered as the essence of an individual, is nothing more than the particular quality or qualities in which it resembles other individuals of the same class; and in consequence of which, a generic name is applied to it. It is the possession of this quality, that entitles the individual to the generic appellation; and which, therefore, may be said to be essential to its classification with that particular genus; but as all classifications are to a certain degree arbitrary, it does not necessarily follow, that it is more essential to its existence as an individual, than various other qualities which we are accustomed to regard as accidental. In other words (if I may borrow the language of modern philosophy), this quality forms its nominal, but not its real essence." See Classification, Abstraction, and Generalization.

After the death of Abelard, the Realists began to revive; the sect of the Nominalists declined, and in the fourteenth century was almost completely extinct. Their doctrine was equally reprobated by the two great parties which then divided the schools; the followers of Duns Scotus and of Thomas Aquinas. (See Scotists and Thomists.) At length, William Occam vindicated the long-abandoned philosophy of Roscelinus. See Nominals.

Although the names of the contending parties no longer exist, the subject of controversy between them has at a very late period interested the attention of philosophers. The most distinguished advocates for the doctrine of the Nominalists, since the revival of letters, are Hobbes, Berkeley, and Hume.

"The universality of one name to many things," says Hobbes (Tripos, chap. v. § 6.) "hath been the cause that men think the things themselves are universal; and so seriously contend, that besides Peter and John, and all the rest of the men that are, have been, or shall be, in the world, there is yet something else that we call man, *viz.* man in general; deceiving themselves, by taking the universal, or general appellation, for the thing it signifieth: for if one should desire the painter to make him the picture of a man, which is as much as to say, of a man in general; he meaneth no more, but that the painter should chuse what man he pleaseth to draw, which must needs be some of them that are, or have been, or may be; none of which are universal. But when he would have him to draw the picture of the king, or any particular person, he limiteth the painter to that one person he chuses. It is plain, therefore, that there is nothing universal but names; which are therefore called indefinite, because we limit them not ourselves, but leave them to be applied by the hearer: whereas a singular name is limited and restrained to one of the many things it signifieth; as when we say, this man, pointing to him, or giving him his proper name, or by some such other way."

Berkeley and Hume do not materially differ from one another. "A very natural question," says the latter, (Treatise of Human Nature, book i. part i. § 7.), "has been started concerning abstract or general ideas: Whether they be general or particular in the mind's conception of them? A great philosopher has disputed the received opinion in this particular; and has asserted, that all general ideas are nothing but particular ones annexed to a certain term, which gives them a more extensive signification, and makes them recall, upon occasion, other individuals, which are similar to them. As I look upon this to be one of the greatest and most valuable discoveries that have been made of late years in the republic of letters, I shall here endeavour to confirm it by some arguments, which, I hope, will put it beyond all doubt and controversy."

Leibnitz has also declared himself a partisan of this sect, in a dissertation entitled "De Stilo Philosophico Marii Nizolii." Dr. Campbell, in his "Philosophy of Rhetoric," has founded an interesting speculation on the principles of Berkeley and Hume. See Abstraction.

Attempts have been made, says our author, for reviving the system of the Realists; and he reckons among the ablest of these that of the excellent Dr. Price, to whom he pays a tribute of merited respect. This approved writer employed, he says, his ingenuity in support of some of the old

old tenets of the Platonic school, and has even gone so far as to follow Plato's example, in connecting the speculation about universals, with the sublime questions of natural theology. His reasonings, he adds, "in proof of the existence of universals, are the more curious, as he acquiesces in some of Dr. Reid's conclusions with regard to the ideal theory of perception. That there are in the mind images or resemblances of things external, he grants to be impossible; but still he seems to suppose, that in every exertion of thought, there is *something* immediately present to the mind, which is the object of its attention." To this purpose, Dr. Price reasons in the following manner: "The word *idea* is sometimes used to signify the immediate object of the mind in thinking, considered as something in the mind, which represents the real object, but is different from it. This sense of an idea is derived from the notion, that when we think of any external existence, there is something immediately present to the mind, which it contemplates distinct from the object itself, that being at a distance. But what is this? It is bad language to call it an image in the mind of the object. Shall we say then, that there is indeed no such thing? But would not this be the same as to say that, when the mind is employed in viewing and examining any object, which is either not present to it, or does not exist, it is employed in viewing and examining nothing, and therefore does not then think at all? When abstract truth is contemplated, is not the very object itself present to the mind? When millions of intellects contemplate the equality of every angle in a semicircle to a right angle, have they not all the same object in view? Is this object nothing? Or is it only an image or kind of shadow? —These inquiries carry our thoughts high."

To the difficulty suggested by Dr. Price, our author says, "I have no answer to make, but by repeating the fact which I have already endeavoured to establish; that there are only two ways in which we can possibly speculate about classes of objects; the one, by means of a word or generic term; the other, by means of one particular individual of the class which we consider as the representative of the rest; and that these two methods of carrying on our general speculations, are at bottom so much the same, as to authorise us to lay down as a principle, that, without the use of signs, all our thoughts must have related to individuals. When we reason, therefore, concerning classes or genera, the objects of our attention are merely signs; or if, in any instance, the generic word should recall some individual, this circumstance is to be regarded only as the consequence of an accidental association, which has rather a tendency to disturb, than to assist us in our reasoning."

For the opinions of a sect that may be regarded as intermediate between the Nominalists and Realists, we refer to CONCEPTIONALISTS. See Stewart's Elements of the Philosophy of the Human Mind. See also *Mental* PHILOSOPHY.

UNIVERSAL *Cause*, *Characters*, *Consumption*, *Geography*, *Gravity*, *Joint*, *Maps*, *Palsy*, *Proposition*, *Rheumatism*, *Ring-dial*, *System*, and *Theorem*. See the substantives.

UNIVERSALISTS, in *Polemical Divinity*, an appellation given to such as hold an universal grace; in like manner as the denomination Particularists is given to those who hold a *particular* and *efficacious* grace.

The Arminians are particularly denominated Universalists.

UNIVERSALISTS, *Hypothetical*, in *Ecclesiastical History*, an appellation given to those doctors of Saumur, who attempted to reconcile the doctrine of predestination, as it had been taught at Geneva, and confirmed at Dort, with the sentiments of those who represent the Deity as offering the displays of his goodness and mercy to all mankind. The first person who made this attempt was John Cameron (see CAMERONIANS), whose sentiments were supported, and farther illustrated, by Moses Amyraut, a man of uncommon sagacity and erudition. The latter applied himself, from 1634, with such zeal to this work, that he produced no small changes in the doctrine commonly received among the reformed in France. The form of doctrine which he proposed with this view may be summed up in the following propositions; *viz.* that God desires the happiness of all men, and that no mortal is excluded, by any divine decree, from the benefits that are procured by the death, sufferings, and gospel of Christ; that, however, no one can be made a partaker of the blessings of the Gospel, and of eternal salvation, unless he believe in Jesus Christ; that such is the immense and universal goodness of the Supreme Being, that he refuses to none the power of believing; though he does not grant unto all his assistance and succour, that they may wisely improve this power to the attainment of everlasting salvation; and that, in consequence of this, multitudes perish through their own fault, and not from any want of goodness in God. Those who embraced this doctrine were called Universalists, because they represented God as willing to shew mercy to all mankind; and hypothetical Universalists, because the condition of faith in Christ was necessary to render them objects of his mercy. Mosh. Eccl. Hist. vol. iv. 8vo.

UNIVERSALITY, the quality that denominates a thing universal.

The Catholics assert the universality of their church, both as to time and persons; and maintain this to be a note or mark of the true church, which distinguishes it from all other societies that pretend to the name.

UNIVERSALITY, in the *Schools*. Logicians made two kinds of universality, the one *metaphysical*, the other *moral*.

UNIVERSALITY, *Metaphysical*, is that which excepts nothing; as this proposition, "Every man is mortal."

UNIVERSALITY, *Moral*, is that which admits of some exception; as, "All old men praise the times past." In such like propositions, it is enough that the thing be ordinarily so; it not being strictly required, that every old man should be of that disposition. See PREDICABLE.

UNIVERSE, a collective name, signifying the assemblage of heaven and earth, with all things in them, called by the Greeks το παν, and by the Latins *mundus*.

The ancients, and after them the Cartesians, imagine the universe to be infinite. The reason they give is, that it implies a contradiction to suppose it finite or bounded; since it is impossible not to conceive space beyond any limits that can be assigned it; which space, according to the Cartesians, is body, and consequently part of the universe. But that the universe is finite, appears from the two following considerations: 1. That whatever consists of parts cannot be infinite, since the parts that compose it must be finite, either in number or magnitude; which, if they be, what they compose must be so too: or, 2. They must be infinite, either in number or magnitude; but an infinite number is a contradiction; and to suppose the parts infinitely big, is to suppose several infinities, one bigger than another; which, though it may pass among mathematicians, who only argue about infinities, *in posse*, or in imagination, will not be allowed in philosophy.

UNIVERSITY, UNIVERSITAS, a collective term, applied to an assemblage of several colleges established in a city, or town, in which are professors in the several sciences, appointed to teach them to students; and where degrees, or certificates of study in the divers faculties, are taken up.

In each university four faculties are usually taught; theology, medicine, law, and the arts and sciences.

They

They are called *universities*, or *universal schools*, because the four faculties are supposed to make the grand world, or whole compass of study; or rather, because they form one whole out of many individuals.

In the eye of the law, an university is held a mere lay body, or community; though, in reality, it be a mixed body, composed partly of laymen, and partly of ecclesiastics. See CORPORATION.

The definition of the term *universitas*, by foreign civilians, answers nearly to our common law term of body politic or corporate; and such towns as had this appellation in Germany, &c. might hold lands and rents in common, and do all other acts as one aggregate body. And in this sense, the word *universitas* came to be applied to such academies for learning as were incorporated, which archbishop Usher thinks began about the year 1250.

Universities had their first rise in the twelfth and thirteenth centuries. Those of Paris and Bologna pretend to be the first that were set on foot; but then they were on a very different footing from the universities among us.

The university of Paris is said to have commenced under Charlemagne, and to owe its rise to four Englishmen, disciples of Venerable Bede, who, going to that city, made a proposal to set up and sell learning, and accordingly held their first lectures in places assigned them by that prince: such is the account given by Gaguin, Gilles, De Bauvais, &c. Though the authors who wrote in those days, as Eginhard, Aimon, Reginon, Sigebert, &c. make not the least mention of this memorable fact.

Add, that Pasquier, Du Tillet, &c. declare openly against the opinion; and assert, that the first foundations were not laid till the time of Lewis the Young, and Philip Auguste, in the twelfth century. The earliest mention we find made of the university of Paris, is in Regordus, who lived in that age, and who was contemporary with Peter Lombard, the master of the sentences, the great glory of that university; in memory of whom an anniversary has been long observed by that body in the church of St. Marcel, where he lies buried.

But it is certain it was not established all at once; it appears to have been at first no other than a public school in the cathedral church; from which it grew, by little and little, under the favour and protection of the kings, into a regular body.

Our own universities, Oxford and Cambridge, seem intitled to the greatest antiquity of any in the world; and University, Baliol, and Merton colleges in Oxford, and Peter's in Cambridge, all made colleges in the thirteenth century, may be said to be the first regular endowments of this kind in Europe.

For though University college in Oxford had been a place for students ever since the year 872, yet this, like many of the other ancient colleges beyond sea, and Leyden to this day, was no proper college; but the students, without any distinction of habits, lived in citizen's houses, having only meeting-places to hear lectures, and to dispute.

In after-times, there were houses built for the students to live in society; only each to be at his own charge, as in the inns of court. These, at first, were called *inns*, but now *halls*.

At last plentiful revenues were settled on several of these halls, to maintain the students in diet, apparel, &c. and these were then called *colleges*.

The universities of Oxford and Cambridge are governed, next under the king, by a chancellor, who is to take care of the government of the whole university, to maintain its liberties, &c.

Under the chancellor is the high-steward, whose office is to assist the chancellor, and other officers, when required, in the execution of their offices, and to hear and determine capital causes, according to the laws of the land, and the privileges of the university. See *University* COURT.

The next officer is the vice-chancellor, who officiates for the chancellor in his absence.

In the university of Oxford there are four pro-vice-chancellors: in the university of Cambridge, the vice-chancellor, and five others, constitute the *caput*, which every university grace must pass before it can be introduced into the senate.

There are also two proctors, who assist in the government of the university, particularly in the business of school-exercise, the taking up degrees, punishing violators of the statutes, &c.

In the university of Cambridge there are also two moderators, two scrutators, and two taxors. In this university there are nineteen professors, besides lady Margaret's preacher: in that of Oxford there are twenty-one professors, including the readers in anatomy and chemistry. Add to these a public orator, keeper of records, librarians, register, esquire and yeoman beadles, clerk, and verger. See COLLEGE. See also CAMBRIDGE and OXFORD.

For the degrees taken up in each faculty, with the exercises, &c. requisite to them, see DEGREE.

The universities of Scotland are four, *viz*. that of St. Andrew's, that of Glasgow, that of Aberdeen, and that of Edinburgh. See each place respectively, and also SCOTLAND.

In noticing the different European universities, under the names of the respective cities and towns in which they are established, we have detailed the histories and prominent events of each. Under the present head it was our intention to have inquired into the progressive and present state of classical learning and science, as these have been ostensibly influenced by the universities; and at the time of writing the account of Oxford, for a previous volume, it was our wish to have investigated, with caution and candour, the state of discipline and tuition of the most eminent universities of Europe. The subject is certainly of interest and importance; and it is rather singular, that in the vast range of literary inquiry and disquisition which characterizes the present age, we have not a work devoted to a comparative view and impartial elucidation of the practical systems of the national schools. For some centuries past these have been regarded as essential to complete the studies of the scholar and gentleman: to these nearly all the national establishments, and even the legislative assemblies, have looked with respect bordering on reverence. Laws have conferred on them many important dignities, privileges, and immunities; their riches and influence have progressively increased; and their powers of directing the minds and talents of their respective pupils, and consequently the countries in which they are placed, are of the highest responsibility. To elucidate these facts with any degree of satisfaction, would occupy a large volume. We must despair of effecting it in a work like the present, and therefore content ourselves with a few remarks and references. By examining the constitutions of the British universities, and the statutes of the different colleges, we shall observe that a laudable and liberal spirit actuated the original founders; and we shall also readily perceive that they have produced great and good effects on the morals and literature of the country. But it will also appear, that many of their ordinances and laws, having been adapted to an age and state of society very different from the present, are now become either obsolete, useless, or, what is much worse, injurious. These should be remodelled: for as the natural tendency of mankind is to advance in knowledge,

ledge, it should be the practice of organized learned bodies to direct the youthful mind in the best and readiest way to learning; to point out the path that should be pursued, rather than follow in a beaten track. An university has been long regarded as the fountain of science and literature, and hence it becomes an imperious duty of its guardians to preserve its streams fresh and pure.

Within the last half century many great revolutions and changes have been produced in the civilized world. Empires, kingdoms, and subordinate states, have been created and have fallen; have been dismembered, torn asunder, overrun with armies, and, in various degrees, affected by political causes. Universities and academies must have been materially influenced by these events: and hence it is not the least difficulty of the historian to ascertain their recent and present states. In some of the cities on the continent they have been entirely altered. Their old foundations have been either abrogated, or remodelled on a new and broader basis. The revolution of France was not merely political, but it produced extensive effects on the old establishments in arts, science, and literature. Many pamphlets and essays were, soon after that event, published on the latter subjects: some vindicating and recommending the old systems, others urging the necessity of modifications, and others contending for the adoption of entirely new establishments. These controversies produced the "National Institute," the constitution and novelties of which have excited much general attention, and produced great changes in the discipline of public schools. (See PARIS, *Literary Institutions.*) Other universities on the continent have been roused by the shock of that revolution, and have endeavoured to adapt their routine of studies, and the subjects of them, to the demands of the age. "All the north of Germany," observes baroness Stael, in her recent work on Germany, "is filled with the most learned universities in Europe. In no country, not even in England, have the people so many means of instructing themselves, and bringing their faculties to perfection. Intellectual education is perfect in Germany; but every thing passes into theory: practical education depends solely on things actually existing: it is by action alone that the character acquires that firmness which is necessary to direct the conduct of life. The German universities possess an ancient reputation, of a date several ages antecedent to the Reformation. Since that epoch the Protestant universities have been incontestibly superior to the Catholic, and the literary glory of Germany depends altogether upon these institutions. A sketch of these is presented in a work just published by M. de Villers, an author who is always found at the head of all noble and generous opinions. The English universities have singularly contributed to diffuse among the people of England that knowledge of ancient languages and literature which gives to their orators and statesmen an information so liberal and so brilliant. It is a mark of good taste to be acquainted with other things besides matters of business, when one is thoroughly acquainted with them; and, besides, the eloquence of free nations attaches itself to the history of the Greeks and Romans, as to that of ancient fellow-countrymen. But the German universities, although founded on principles analogous to those of Oxford and Cambridge, yet differ from them in many respects: the multitude of students assembled together in Gottingen, Halle, Jena, &c. formed a kind of free body in the state: the rich and poor scholars were distinguished from each other only by personal merit; and the strangers, who repaired from all parts of the world, submitted themselves with pleasure to an equality which natural superiority alone could disturb."

Although there are no universities in Belgium, yet the college of Ghent is instituted for the same purpose, and calculated to produce very beneficial effects. Its plan of education, and general regulations, are worthy of imitation. The functionaries consist of a regent, two sub-regents, and six professors in Greek and Latin poetry, and in rhetoric; besides six other professors in French, English, German, drawing, and mathematics. These have not only the charge of educating the pupils, but of watching their morals and manners. They are required to make monthly reports to the mayor, and to the parents of the respective children. See a full and interesting account of this seminary in Mitchell's "Tour through Belgium," &c. 8vo. 1816; in which work is also contained, a review of the system of education in the college of Bruffels, the central schools of France, the university of Leyden, and the university of Utrecht.

In Great Britain, some useful and essential improvements have been adopted in the present century: but they do not appear to have been produced so much from rivalry with foreign schools, as by the general emulation excited by metropolitan and provincial institutions. Within the last twenty years, London has presented nearly all the advantages, without any of the fetters, of established universities; for in this vast city, many literary and scientific institutions have been formed, and many courses of lectures delivered, all calculated to improve the rising generation. (See LONDON, *Literary Institutions*; LIVERPOOL, and MANCHESTER.) Hence the emulous mind has exhaustless sources of learning: and hence a new era has been created in the annals of England.

In no one subject, perhaps, is the advantage of a free press more apparent than in that now under consideration. But for this, many useful plans would never have been carried into effect; many errors of the dark ages would have continued and increased; many establishments would have descended in utility, whilst they ascended in wealth and power. Public discussion on these subjects occasions a minute investigation into the principles and practices of old establishments; places them in a state of comparison with new; and causes a deliberate enquiry into the utility and practicability of new theories, before they have gone through the routine of experience. Many authors have thus been induced to publish their opinions and animadversions on the discipline and practices of the old universities of England; and these have produced useful effects. Still, however, some of the writers contend that the old establishments do not sufficiently attend to the demands and improvements of the age: but that they persist in studies which are useless and obsolete, to the neglect of those which are necessary, and which are calculated to be practically useful. Gibbon, in his "Life and Opinions," says, "The schools of Oxford and Cambridge were founded in a dark age of false and barbarous science; and they are still tainted with the vices of their origin. Their primitive discipline was adapted to the education of priests and monks; and the government still remains in the hands of the clergy, an order of men whose manners are remote from the present world, and whose eyes are dazzled by the light of philosophy." The same learned and eloquent writer enters into a disquisition on the prejudices, errors, and wrong discipline of these schools.

Dr. Knox also, in his "Moral and Literary Essays," the Edinburgh Review, vol. xvi. and other writers, have published their opinions on the same subject. In reply to which, and in vindication of the present practice, Mr. Coplestone of Oxford published a pamphlet in 1810. Other members of the respective universities have also come forward in defence of their schools: and hence the subject is brought

brought before the public tribunal, the ultimate decision of which is generally just and sound. See also Monthly Review, vol. lxxviii. p. 277. The Oxford and Cambridge University Calendars, for 1816 and 1817. Chalmers's Account of the Colleges and Halls of Oxford, 2 vols. 8vo. Dyer's History of the University and Colleges of Cambridge, 2 vols. 8vo.

The chief foreign universities are those of Abo, in Finland, frequented by students from Russia, and, in number, equalling that of Upsal; of Austria, at Vienna, founded in 1237, and improved since 1752; at Prague, founded in 1347; at Inspruck, dated from 1677; and at Gratz, from 1585; of Benares, in Hindoostan; of Buda, in Hungary; and of Calcutta, established by the marquis of Wellesley, the plan of which is extensive and liberal. Besides Hindoo, Mahomedan, and English law, and the local regulations, it was designed to have professors of civil jurisprudence, political economy, geography, history, &c. The languages to be taught were Arabic, Persian, Sanscrit, Hindoostanee, Bengal, Telinga, Maratta, Tamula, and Canara. But this institution has declined. We may mention also the universities of Coimbra in Portugal, of Copenhagen, of Debritzin, and of Erlau. France formerly boasted of twenty-one universities; *viz.* in the North Douay, Caen, Paris, Rheims, Nancy, Strasburgh; in the middle provinces, Nantes, Angers, Poitiers, Orleans, Bourges, Dijon, Besançon; and in the south, Bourdeaux, Pau, Perpignan, Toulouse, Montpellier, Aix, Orange, and Valence. Of these, the Sorbonne of Paris was the most celebrated, though somewhat degraded by its tendency to prolong the reign of scholastic theology. The university of Georgia, in America, founded at Louisville in 1801, though Dr. Morse says it had its charter in 1785, and possessing funds to the amount of 50,000 acres of land. The university of Gottingen, in Hanover, was founded by George II. in 1734, solemnly opened in 1737, and has acquired considerable celebrity. Harward university, in Cambridge, Massachusetts, founded in 1638, is the most ancient literary establishment in North America. The universities of Holland are those of Leyden, formerly much celebrated and frequented, but somewhat declined, on account of certain commercial regulations; of Utrecht, of Harderwyck, of Franche, and Groningen. Ingolstadt has an university, and so has Kiel, in Denmark. The university of St. Mark, in Lima, was founded in 1576, and is conducted on the plan of the Spanish universities. The university of Lunden, in Sweden, accommodates about 300 students. The universities of Hesse, in Germany, are those of Marburg and Rindeln, and that of Giessen, belonging to Hesse-Darmstadt. In Mexico an university was founded in 1551, and it is styled royal and pontifical; and the cloister is composed of 251 doctors, of all sorts of faculties. Its library was collected about forty years ago, and consists of many old books of divinity, but few modern publications. The universities of the Netherlands were formerly numerous, considering the extent of the country. Exclusive of Tournay (Dornick), which has been long subject to the French, there were others at Douay and St. Omer, much frequented by the English Catholics; and one of still greater celebrity at Louvain, founded in 1425. Their illustrious professors, though celebrated by Guicciardini, nephew of the great historian, have been long since forgotten. The universities of Parma and Placentia need only be mentioned. The university of Pavia is in high reputation, and is regarded as the first in Italy. Its professors have distinguished themselves in natural history. The university of Pennsylvania was founded at Philadelphia during the war, and having been since united with the college, is become a respectable seat of learning. Rostock, in the duchy of Mecklenburg, has an university. In Portugal, besides the university of Coimbra already mentioned, there is that of Evora, founded in 1553. Prussia has several universities, that of Frankfort on the Oder, founded in 1516, and that of Konigsberg, in 1544. Of the Polish universities, Cracow, founded in 1364, has fallen to Austria; and Wilna, founded in 1570, to Russia. Posna or Posen has become subject to Prussia. The university of Petersburgh was founded by the late empress Catharine II. The universities of Spain are computed at upwards of 20; but the most noted is that of Salamanca, founded in 1200. The universities of Sweden are those of Upsal, Lunden, and Abo. The university of Tubingen on the Neckar was founded in 1477; that of Turin was founded in 1405; that of Vienna has been already mentioned. In the province of Yemen, in Arabia, there are two universities or celebrated academies, one at Zebid, for the Sunnis, and another at Damar, for the Zeidites.

UNIVERSITY *Courts.* See *University* COURT, and UNIVERSITY, supra.

UNIUM, the *Odiel*, in *Ancient Geography*, a river of Hispania, in Bœtica, which united with the Luxia.

UNIVOCAL, in the *Schools*, is applied to two or more names, or terms, that have but one signification: in opposition to *equivocal*, which is, where one term has two or more significations.

Or, univocal terms are such whose name, as well as nature, is the same; in opposition to equivocals, whose names are the same, but their natures very different.

For a thing to be predicated univocally of any others, it is to be attributed to all of them alike, and in the same proper sense. See PREDICATE and PREDICABLE.

UNIVOCAL *Generation.* The doctrine of the ancients, with respect to propagation, was, that all perfect animals were produced by univocal generation, that is, by the sole union, or copulation, of a male and female of the same species, or denomination; and that insects were produced by equivocal generation, without any seed, and merely of the corruption of the earth exalted, and, as it were, impregnated by the sun's rays; but this is wholly erroneous.

Some philosophers make a kind of intermediate generation between equivocal and univocal, which they call *analogous generation.* See GENERATION.

UNIVOCAL *Action.* See ACTION.

UNIVOCAL *Cause.* See CAUSE.

UNIVOCALS, called by the Greeks *synonyma*, are defined by Aristotle to be those things whose name is common, and also the reason corresponding to the name; that is, the definition of the idea affixed to it the same.

Thus, under the name and definition of *animal*, man and brute are equally included; and circle and square, in the reason or definition of a *figure*.

Here, the word, as *figure*, they use to call *univocum univocans*, or *univocating univocal*; and the things included under the univocal name, as circle and square, *univoca univocata, univocated univocals.*

UNIVOCATION, in *Logic* and *Metaphysics.* The schoolmen have long disputed about the univocation of being, *i. e.* whether the general idea of *being* agree in the same manner, and in the same sense, to the substance, and the accident, to God and the creature?

UNIVOQUE, Fr., in *Music.* Univocal concords are the octave, and its recurrences or repetitions above or below, as they never change their name or effect. Ptolemy was the first who gave them this appellation.

UNKA, in *Geography*, a town of Sweden, in the province of Smaland; 85 miles N. of Calmar.

UNKEI-TENKY, a town of Hindooftan, in Baglana; 7 miles N.E. of Chandor.

UNKEL. See UNCKEL.

UNKENACH, a town of Auftria; 6 miles W. of Schwanaftatt.

UNLACING, in *Sea Language*, the act of loofening and taking off the bonnet of a fail from its principal part.

UNLAWFUL, ILLEGAL, fomething prohibited by, or contrary to the terms of a law, either divine or human.

UNLAWFUL *Affembly*, the meeting of three or more perfons together, by force to commit fome unlawful act; as, to affault any perfon, to enter his houfe, or land, &c. and thus abiding together, whether they attempt the execution or not. See REBELLIOUS *Affembly*, RIOT, and ROUT.

By the ftat. 16 Car. II. if five perfons, or more, fhall be affembled together, above thofe of the family, at any conventicle, or meeting, under colour of any exercife of religion, it is unlawful, and punifhable by fines, and otherwife, as in that ftatute is provided. See CONVENTICLE.

UNLIKE *Quantities* and *Signs*, in *Algebra*. See LIKE *Signs and Quantities*.

UNLIMITED, or *Indeterminate Problem*, is fuch a one as is capable of infinite folutions. As, to divide a triangle given into two equal parts; to make a circle pafs through two points affigned, &c. See DIOPHANTINE and INDETERMINATE.

UNLUTING, in *Chemiftry*, the taking away of the lute, loam, or clay, with which a veffel was before clofed, joined to another, or covered.

UNMOOR, *To*, in *Sea Language*, is to reduce a fhip to the ftate of riding by a fingle anchor and cable, after fhe has been moored or faftened by two or more cables.

UNNA, in *Geography*, a river which rifes in Bofnia, on the borders of Croatia; 28 miles S. of Bihacs, and runs nto the Save, 16 miles N.W. of Gradifca.—Alfo, a town of Germany, in the county of Mark. This place is in rank the fecond town of the county, and lies in a fine plain, on a rivulet named the Kottelbecke. It has a Lutheran parifh-church, and a hofpital church, which the Calvinifts ufe for their worfhip, but in which alfo on Saturdays worfhip is performed by a Lutheran preacher; as alfo a nunnery, together with a chapel, and a Lutheran fchool. This town is poffeffed of a very extenfive and profitable territory. Formerly it conftituted one of the Hanfe towns. So early as the year 1032, Unna was a confiderable village, and, together with its extent of territory, belonged to the archbifhop of Cologn. In the year 1250, it was environed with walls, and endowed with the immunities of a town; 23 miles S. of Munfter. N. lat. 51° 33′. E. long. 7° 48′.

UNNAP-POUPPY, a town of Meckley; 75 miles S.S.E. of Munnypour.

UNNARY, a town of Sweden, in the province of Smaland; 43 miles W. of Wexio.

UNONA, in *Botany*, a name evidently contrived to preferve an analogy with *Annona*, to which the genus which bears it is nearly related. Perhaps Linnæus had in view the union of the ftamens with the germen, in the formation of this name.—Linn. Suppl. 44. Schreb. Gen. 375, 834. Willd. Sp. Pl. v. 2. 1271. Mart. Mill. Dict. v. 4. Juff. 283.—Clafs and order, *Polyandria Polygynia*. Nat. Ord. *Coadunatæ*, Linn. *Annonæ*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of three fmall, acute, clofe-preffed leaves. *Cor.* Petals fix, lanceolate, feffile, gibbous at the bafe externally, and concave at the fame part within. *Stam.* Filaments none; anthers nnumerable, oblong, collected into a denfe ball, within the hollow of the bafe of the corolla. *Pift.* Germens feveral, clofely covered by the anthers; ftyles about ten, briftle-fhaped, crowded, rather longer than the anthers; ftigmas .... *Peric.* Berries feveral, ftalked, ovate, gibbous, compofing a fpreading umbel. *Seeds* two, one above the other, ovate, very fmooth, abrupt at the bafe.

Eff. Ch. Calyx three-leaved. Petals fix. Berries feveral, ftalked, each with two feeds.

Obf. Linnæus fuggefts that this genus ought to be referred to *Gynandria*, and he has led the writer of the prefent article into the fame miftake, concerning *Nymphæa*, in Prodr. Fl. Græc. v. 1. 360, corrected in v. 2. 359, of the fame work. We are now convinced, that no genus can be fafely termed gynandrous, except the ftamens are inferted into the piftil above the germen. *Unona* is clofely connected in character and habit with *Uvaria*, and perhaps ought to be united therewith. Willdenow has referred hither two fpecies of *Defmos* of Loureiro, and *Uvaria zeylanica* of Aublet; but having no original information relative to thefe three plants, we prefer retaining the Linnæan *Unona* by itfelf.

1. U. *difcreta*. Linn. Suppl. 270.—Gathered by Dahlberg in Surinam, where it is called *Peyricoboom*. This is a *tree* with flender, flexible, round, alternate *branches*, clothed when young with rufty down. *Leaves* alternate, willow-like, on fhort ftalks, lanceolate, two inches long, taper-pointed, bluntifh, entire; fmooth above; beautifully filky beneath. *Flowers* axillary, folitary, on fhort ftalks. *Petals* externally filky. *Fruit* the fize of a large pea. In a dried ftate it feems rather a *capfule* than a *berry*.

UN POCO, in *Italian Mufic*, a little; as, *un poco piu allegro*, a little quicker; *un poco piu largo*, a little flower.

UNQUES PRIST, *Always ready*. See UNCORE *Prift*.

UNRECLAIMED HAWK, one that is untamed.

UNREEVING *a Rope*. See REEVING.

UNREST, in *Geography*. See ONRUST.

UNRIGGING *of a Ship*, is the taking away of the ftanding and running rigging.

UNSEELING, in *Falconry*, a taking away of the thread that runs through the hawk's eye-lids, and hinders her fight. See HAWK.

Drawing the ftrings of the hood, to be in readinefs to pull off, is called *unftriking the hood*.

UNSER FRAU, in *Geography*, a town of Auftria; 1 mile N. of Weitra.

UNS FRAU NAZARETH, a town of the duchy of Stiria; 10 miles S.W. of Windifch Gratz.

UNS FRAU WEISTEN, a town of the duchy of Stiria; 11 miles W. of Marburg.

UNST, is the moft northern of the Shetland ifles, and the moft northern territory of the Britifh empire, being fituated in the latitude of 61°. Its form is of an irregular oblong fquare, extending in length about ten miles, and in breadth from two to four. In comparifon with the other Shetland ifles, Unft may be confidered level, yet its furface is diverfified by feveral extenfive ridges of hills; the moft remarkable are, Vallafield, which rifes to the height of 600 feet, and Saxaforth, elevated 700 feet above the level of the fea. The ifland is not interfected by rivers, but contains feveral frefh-water lakes; loch Cliff, the largeft, is two miles long, and about half a mile in breadth. The fea-fhores are remarkably indented with bays and creeks, having many fmall iflands and pafture holmes fcattered around. Along the coaft are feveral natural caves, of confiderable extent;

extent; one of which, under a promontory of the hill of Saxaforth, penetrates at least 300 feet under ground. In general, the soil is tolerably fertile, even under the worst modes of culture; and the pasture-grounds are mostly covered with a short tender heath, which affords excellent feeding for sheep, of which about 7000 are kept here, with about 2000 cows, and 1000 horses. Hogs are also fed in great numbers; and rabbits are very abundant. Fishing is an important branch of the industry of the inhabitants, and about eighty tons of cured fish are annually exported. Unst abounds in iron-stone, and possesses many large veins of jasper: rock-crystals have sometimes been found, and free-stone is abundant. The parish-church, which was built in 1764, stands at a place called Balcasta, at the distance of three miles from the minister's residence. Formerly there were twenty-four chapels on the island, the remains of which may still be distinctly traced. Unst constitutes a parish of itself; and according to the return of the year 1811, contains a population of 2288, occupying 385 houses. Here is no post-office; the only office in Shetland is forty miles distant from hence: so that, from its remote situation, and its little intercourse, especially during winter, with the mother country, the inhabitants of Unst are frequently strangers, for many weeks, to the greatest national occurrences. In this island, the longest day is nineteen hours fifteen minutes, and consequently, the shortest day is four hours forty-five minutes.—Beauties of Scotland, vol. v. Shetland, 1808. Gazetteer of Scotland, 1806. Carlisle's Topographical Dictionary of Scotland, 1813.

UNSTRUT, a river which rises four miles W. of Dingelstadt, in the territory of Eichsfeld, and joins the Saal, about two miles N. of Naumburg.

UNSUMMED, a term used by falconers for a hawk's feathers before they have arrived at their full length.

UNTERART, or ART, in *Geography*, a town of Switzerland, in the canton of Schwitz, at the southern extremity of the lake of Zug; 7 miles N. of Schwitz.

UNTERBIRG, a town of Saxony, in the Vogtland; 1 mile S. of Plauen.

UNTERMDORFF, a town of Austria; 6 miles N. of Aggspach.

UNTERSEE, a lake in the duchy of Carinthia; 10 miles W. of Velach.

UNTERSEEN, a town of the duchy of Holstein; 5 miles N.W. of Pinnenberg.—Also, a town of Switzerland, in the canton of Berne, purchased of the counts of Hohenzollern. This town is situated between the lakes of Brientz and Thun; 26 miles S.E. of Berne.

UNTOORAH, a town of Hindoostan, in Goondwana; 60 miles W. of Nagpour.

UNTZINA, a town of Walachia; 30 miles N.E. of Bucharest.

UNUCA, in *Ancient Geography*, a town of Africa Propria, upon the route from Carthage to Cæsarea, between Carthage and Sicilibra. Anton. Itin.

UNUNGE, in *Geography*, a town of Sweden, in the province of Upland; 28 miles E. of Upsal.

UNXIA, in *Botany*, from *ungo*, *unxi*, *to anoint*, because of its salve-like odour, and its external, as well as internal, use as a sudorific.—Linn. Suppl 56. Schreb. Gen. 554. Willd. Sp. Pl. v. 3. 2339. Mart. Mill. Dict. v. 4. Juss. 186. Lamarck Illustr. t. 699. Gærtn. v. 2. 421.—Class and order, *Syngenesia Polygamia-necessaria*. Nat. Ord. *Compositæ oppositifoliæ*, Linn. *Corymbiferæ*, Juss.

Gen. Ch. *Common Calyx* roundish, of five ovate, nearly equal, concave leaves, in a simple row. *Cor.* compound, radiated; florets of the disk five, or more, male, funnel-shaped, in five equal segments; those of the radius five, or more, female, small, lanceolate. *Stam.* Filaments, in the florets of the disk, five, capillary; anthers united into a pentagonal tube, rather longer than the corolla. *Pist.* in the same florets imperfect; in those of the radius, Germen ovate; style simple; stigma cloven. *Peric.* none, except the permanent calyx. *Seeds* in the circumference only, ovate, abrupt, hard, without any seed-down, or crown. *Recept.* naked, flat.

Eff. Ch. Receptacle naked, flat. Seed-down none. Calyx of five leaves, simple.

Obs. Schreber was led by the disagreement between the description of this genus, and the place allotted to it by Linnæus in his system, to make some corrections, without seeing the plant. The above, taken from the original specimen, will be found nearer the truth. *Unxia*, in fact, belongs, as truly as *Calendula*, to the order of *Polygamia-necessaria*, the florets of the disk having no more of a germen than is necessary to serve as a partial stalk.

1. U. *camphorata*. Camphorated Balsam-weed. Linn. Suppl. 368. Willd. n. 1.—Leaves lanceolate. Young branches downy.—Gathered by Dahlberg, in sandy situations in Surinam, where it goes by the name of *Campher-plant*, being remarkable for a strong camphor-like smell. A watery decoction of this herb, taken internally, is esteemed an excellent and powerful sudorific, in the obstinate lumbago which prevails at Surinam. The dry plant, applied outwardly, is supposed useful in restoring perspiration. The *root* is probably annual. *Stem* herbaceous, two feet high, round, slender, striated, forked; the young branches shaggy, with soft hairs. *Leaves* opposite at each fork of the stem, sessile, lanceolate, an inch and a half long, sparingly toothed, five-ribbed, clothed on both sides with soft hoary hairs. *Flowers* from the forks of the stem, mostly solitary, on hairy stalks of various lengths. *Calyx* the size of a pea, nearly smooth. *Corolla* yellow. *Seeds* tumid, angular, half the length of the calyx, of a pale grey. Lamarck's figure is the only one extant of this genus, and is sufficiently expressive of the original species here described. With the following we are unacquainted.

2. U. *hirsuta*. Hairy Balsam-weed. Richard Actes de la Soc. d'Hist. Nat. de Paris, v. 1. 112. (not 105.) Willd. n. 2.—"Leaves oblong, somewhat heart-shaped, hairy. Stem villous."—Native of Cayenne. This is said to be extremely hairy in every part. *Leaves* bluntish, somewhat ovate. *Florets* numerous. *Root* annual.

The habit and characters of *Unxia* approach ECLIPTA; see that article.

UNZA, in *Geography*, a town of Russia, in the government of Kostrom; and capital of a province on a river of the same name; 92 miles E.N.E. of Kostrom. N. lat. 57° 56′. E. long. 44° 14′.—Also, a province of Russia, forming a part, and the largest part, of the government of Kostrom, 160 miles in length, and from 80 to 112 in breadth; bounded on the north by the government of Vologda, on the east by the government of Viatka, on the south by the government of Nizegorod, and on the west by the province of Kostrom.—Also, a river of Russia, which runs into the Volga, near Jurev Povolskoi, in the government of Kostrom.

VOAM-TCHIM HOTUN, a town of Corea; 642 miles E.N.E. of Peking. N. lat. 43° 3′. E. long. 129° 44′.

VOAN-TSUSEN, a city of China, of the second rank, in Pe-tche-li; 22 miles N.N.W. of Suen-hoa.

VOARCHADUMIA, a kind of cabala, or enigmatic art relative to metals, which proposes the exaltation of gold by

by cementations, and other methods; among which, charms made of the Hebrew letters have their place.

VOBARNO, in *Geography*, a town of Italy, in the department of the Benaco; 5 miles N.W. of Salo.

VOBERGA, or VOBISCA, in *Ancient Geography*, a town of Hispania Citerior, in a hunting country, according to Martial, l. i. epig. 52. v. 14.

> "Præstabit illic ipsa fingendas prope,
> Vobisca prandenti feras."

VOBERNA, or VOBERNUM, a town of Gallia Transpadana, upon the banks of the river Clusius (the Chiesa).

VOBRIX, a town of Africa, in the interior of Mauritania Tingitana; now said to be Lempta, in the kingdom of Fez, with considerable ruins.

VOCA, a town of Hispania Citerior, belonging to the Callaici Lucenses. Ptolemy.

VOCA, in *Ichthyology*, a name given by Gaza, and some other writers, to the fish called *boops* by the generality of writers. It is a species of the spari, and is distinguished from the rest by having four longitudinal parallel lines of a bright yellow and white colour, resembling gold and silver, on its sides.

VOCABULARY, VOCABULARIUM, formed of *vocabulum, word*, in *Grammar*, denotes the collection of the words of a language, with their significations; otherwise called a *dictionary*, *lexicon*, or *nomenclature*.

The vocabulary is, properly, a less kind of dictionary, which does not enter so minutely into the origins, and different acceptations of words. Though the Italian vocabulary of the Academy de la Crusca seems to be an exception from this distinction, as being a copious and exact work, in three volumes folio, said to have been forty years in compiling. And the like holds of the Vocabulario Portuguez of F. Bluteau, in ten volumes folio: in the titles of both these books the word is used in a larger sense.

VOCAL, something that relates to the voice or speech. Thus, *vocal prayer* is that which is spoken out, or delivered in words, in contradistinction to *mental prayer*.

In our ancient customs, *vocalis* is frequently used for *so called*: "post hæc Merganus de tribu Walensium, &c. alter nomine Madocus vocalis princeps eorum." Matt. Paris.

VOCAL is sometimes also used substantively, in speaking of matters of election, to signify a person who has a right to vote. Thus the Romanists say, a man must have been a religious a certain number of years to be vocal.

VOCAL *Music*, is music set to words, especially verses, and to be performed with the voice: in contradistinction to *instrumental music*, composed only for instruments, without singing.

Poetry then makes a necessary part of vocal music; and this appears to have been the chief, if not the only practice of the ancients, from the definitions which they give us of music.

Their vocal music seems to have had some advantage over ours, in that the Greek and Latin languages were better contrived to please the ear than the modern ones. In effect, Vossius taxes all the later languages as unfit for music; and says, "We shall never have any good vocal music till our poets learn to make verses on the model of the ancients;" *i. e.* till the ancient metrical feet and quantities are restored.

But it is to be observed, that the rhythmus of their vocal music was only that of their poetry, and had no other forms and mutations than what the metrical art afforded.

Their changes were no other than from one kind of metrum or verse to another, as from iambic to choraic. See MEASURE and RHYTHMUS.

Their vocal music, then, consisted of verses set to musical tunes, and sung by one or more voices, in chorus, or alternately; sometimes with, and sometimes without the accompaniments of instruments.

As for instrumental music, in the manner we have defined it, it is not very clear that they ever had any. See SYNAULIA, &c.

VOCANUS AGER, in *Ancient Geography*, a territory of Africa Propria, in the vicinity of the town of Acholla, and of that of Thapsus. Livy.

VOCATES, a people of Gallia Aquitanica, of the number of those who were subjugated by Crassus, according to Cæsar.

VOCATION, CALLING, among *Divines*, the grace or favour which God does any one in calling him out of the way of death, and putting him into the way of salvation.

In this sense we say, the *vocation of the Jews*, the *vocation of the Gentiles*, &c. There are two kinds of vocation, the one *external*, the other *internal*. The first consists in a simple and naked proposing of objects to the will; the second is that which renders the first effectual, by disposing our faculties to receive those objects.

VOCATION is also used for a destination to any state or profession. It is a rule that none are to enter the ecclesiastic or monastic state, without a particular vocation, or call.

The Romanists hold the vocation of the reformed divines null and invalid. Among ourselves, some hold an uninterrupted succession necessary to the validity of the vocation of a priest.

VOCATIVE, in *Grammar*, the fifth case, or state of nouns.

When we name the person we are speaking to, or address ourselves to the thing we are speaking of, as if it were a person, the noun or name acquires a new relation, which the Latins and Greeks express by a new termination, called the *vocative*.

Thus, of *Dominus*, *Lord*, in the nominative, the Latins have made *Domine*, *O Lord*, in the vocative; of *Antonius*, *Antoni*, &c. But as this was a thing not absolutely necessary, and as the nominative case might very well serve on such occasions, this new case, or termination, was not universal: in the plural, for instance, it was the same with the nominative; and even in the singular, it was only practised in the second declension among the Latins; and in Greek, where it is the most common, it is frequently neglected, and the nominative used instead of it; as in that passage in the Greek Psalms, quoted by St. Paul, θρόνος σου ὁ Θεὸς, *thy throne, O God*.

In English, and most of the modern tongues, this case is ordinarily expressed in nouns that have an article in the nominative, by suppressing that article; as, *the Lord is my hope.—Lord, thou art my hope!* though on many occasions we use an interjection.

VOCATORES, among the *Romans*, were servants whose business it was to call the guests, receive them, and assign every one a place according to his dignity.

VOCAYAMO, in *Geography*, a town of Japan, in the island of Niphon; 15 miles N.W. of Meaco.

VOCE SOLA, in the *Italian Music*, denotes a piece composed for a single voice, generally accompanied with a thorough-base on the harpsichord or organ, without other instruments. But if, besides that it is to be accompanied by other instruments, they add, *con violini*, with violins; *duo violini, e violoncello, e basso per l'organo, i. e.* with two violins, a base

a base violin, and a thorough-base on the organ; *con violini o stromenti, i. e.* with violins or instruments; *parti con, parti senza violini, i. e.* part with, part without violins, &c.

VOCETIUS MONS, in *Ancient Geography*, a mountain mentioned by Tacitus, in Helvetia, applicable to a branch of mount Jura, which approaches the Rhine above Augusta Rauracorum.

VOCHY, in *Botany*, Aubl. Guian. v. 1. 18. t. 6. Poiret in Lam. Dict. v. 8. 681, the Caribbean name of a fine tree in Guiana. (See CUCULLARIA.) It is scarcely credible that Jussieu and Lamarck should have attempted to render the above name admissible, or have thought they improved it, by changing it to *Vochisia*; Juss. Gen. 424. Lamarck Illustr. t. 11. The natural order of this genus remains doubtful.

VOCIFERATIO, in our old *Law-Books*, the same with *hue and cry*.

"—Qui furem plegi tum dimiserit, qui ei obviaverit, et gratis sine vociferatione dimiserit, &c." Leg. Hen. I.

VOCLADE, in *Ancient Geography*, a place of Gallia Aquitanica, belonging to the Pictavii, celebrated by the defeat of Alaric, slain by Clovis.

VOCOKIURA, in *Geography*, a town of Japan, in the island of Ximo; 33 miles N. of Nangasaki.

VOCONIAN LAW, in *Roman Antiquity*, a testamentary law prepared by Q. Voconius, tribune of the people, which prohibited every citizen from making any woman universal legatee, not excepting an only daughter, and enjoined a daughter's fortune, after her father's death, to be proportioned to his estate, according to the estimation of prudent men; and this proportion was usually one-fourth of her father's estate; and, moreover, that all the legacies of the testator should not exceed one half of his estate. This was intended as a supplement to the Furian law; the time of its passing is fixed by Cicero, de Senect. to the year of Rome 584, when Q. Marcius Philippus, and Cn. Servilius Cæpio, were consuls. It was revoked by Augustus in favour of Livia, to whom he was resolved to devise by will a great part of his estate. However, though, by the abrogation of this law, married women were not restrained from receiving any legacies above a certain sum, yet Augustus bestowed on such women as had vowed perpetual virginity the same rewards and privileges as upon mothers.

VOCONTII, in *Ancient Geography*, a people of Gallia Narbonnensis, N. of the Memini. According to Strabo, they extended themselves to the frontier of the Allobroges, in valleys that were deep and difficult of access. Mela mentions them, and Vasio their capital. The Vocontii were governed by their own peculiar laws. They appear to have occupied not only the dioceses of Vaison and of Die, but a part of the diocese of Gap and of that of Sisteron.

VODABLE, in *Geography*, a town of France, in the department of the Puy de Dôme; 4 miles S.W. of Issoire.

VODANA, a town of Arabia, in the province of Oman, on the Moiesur; 40 miles S.W. of Oman.

VODERKAMP, a town of the duchy of Holstein; 31 miles E. of Lutkenborg.

VODLA, a river of Russia, which runs from lake Vodlo, and enters lake Onezskoe, near Pudoga.

VODLITZA, a river of Russia, which runs into lake Ladoga; 16 miles N.W. of Olonetz.

VODLO, a lake of Russia, in the government of Olonetz; 16 miles N. of Pudoga.

VOECA, in *Ancient Geography*, a town of Hispania Citerior, belonging to the Callaici Lucenses. Ptolemy.

VOEGLARBY, in *Geography*, a town of Sweden, in Dalecarlia; 17 miles S. of Fahlun.

VOEN, a river of China, which runs into the Hoai, 10 miles E.N.E. of Ngan-kieou, in the province of Chantong.

VOERDEN. See VORDEN.

VOET, GISBERT, in *Biography*, an eminent Dutch divine, was born at Heusden in the year 1589; and after having pursued his studies at Leyden for seven years, and superintending some churches taken from the Catholics, he settled in 1617 in his native place, where he exercised his ministry with exemplary diligence. In 1634 he was advanced to the chair of theology and the oriental languages in the university of Utrecht, and became co-pastor in one of the churches. About this time the Cartesian philosophy engaged attention, and its progress so alarmed Voet, that, in 1639, he made a public attack upon its principles, charging them with an atheistical tendency; and in this attack, though Des Cartes defended himself with acuteness, and not without treating his adversary with some degree of contempt, Voet was supported by the majority of the Dutch clergy, and also by the States of Holland. Besides his writings against Des Cartes, he wrote also several theological works; and continued in the exercise of his various functions at Utrecht till his death in 1677, at the advanced age of eighty-eight years. His son, PAUL VOET, was born in 1619, and became professor of law at Utrecht, where he published various works in the department of his profession. He died in 1667. JOHN VOET, the son of Paul, was a professor of law at Leyden, and the author of a highly valued "Commentary on the Pandects," 2 vols. folio, 1698—1704. He died in 1714. Moreri. Mosheim.

VOG, in *Commerce*, a weight in Denmark, containing three bismerponds, or thirty-six pounds.

VOGEL, in *Geography*, a small island in the East Indian sea. S. lat. 5° 12′. E. long. 130° 46′.—Also, a river of Austria, which runs into the Traun, 8 miles S.W. of Wels.

VOGEL *Islands*, a cluster of small islands near the W. coast of Siam. N. lat. 7° 38′. E. long. 98° 55′.

VOGELIA, in *Botany*, bears that name, doubtless, in memory either of Benedict Christian Vogel, professor at Altorf, born in 1744, who published in 1768, a small academical essay, on the Generation of Plants; or of Rudolph Augustin Vogel, professor at Gottingen, who died in 1774, aged 50, having written on the sleep of plants, on the balsam of Mecca, and on various mineralogical subjects.—Lamarck Illustr. v. 1. 376. t. 149.—Class and order, *Pentandria Monogynia*.

Eff. Ch. Calyx inferior, of five ovate, folded, transversely corrugated leaves. Corolla of one petal, tubular, plaited, five-cleft. Stigma in five capillary segments.

The figure represents a branched plant, with small, alternate, nearly sessile, inversely heart-shaped, entire *leaves*, each tipped with a small point, and dotted on the surface. *Flowers* in solitary terminal *spikes* near two inches long. *Corolla* an inch long. *Stamens* within the tube, equal, capillary. *Germen* ovate. *Style* capillary.—The letter-press of Lamarck's work has not extended to this, his 405th genus, except so far as to give its essential character, nor do we find any traces of *Vogelia* in his or Poiret's part of their Dictionary. We are therefore in the dark as to the number of species of this genus, its native country, or any other particular in its history. The plate above quoted is in Plumier's style.

Vogelia is also a synonymn of TRIPTERELLA; see that article.

VOGELSANG, in *Geography*, a town of Prussia, on the Frisch Nerung; 13 miles N. of Elbing.

VOGESUS, or VOSEGUS, MONS, in *Ancient Geography*, a chain of mountains, which commenced on the confines of the Lingones; and after having covered the northern part of the country of the Sequani, prolonged itself towards the N., between the Leuci and Mediomatreci on one side, and the Triboci and Nemetes on the other.

VOGHERA, in *Geography*, a town of Italy, in the Pavese; 12 miles S. of Pavia.

VOGIA, in *Ancient Geography*, a town of Hispania, in the interior of Bœtica, belonging to the Turduli. Ptol.

VOGLABRUCK, in *Geography*, a town of Austria, on the river Vogel. This place enjoys the privilege of granting protection to all slaves, and its burghers and merchants, together with their wares, are toll free throughout all the Austrian countries; 27 miles S.S.E. of Passau. N. lat. 48° 1′. E. long. 13° 35′.

VOGLAMARCK, a town of Austria; 3 miles S.W. of Voglabruck.

VOGLER, GEORGE JOSEPH, the *Abbé*, in *Biography*, honoured by the pope with the order of the *Speron d'oro*, or golden spur, was born at Murzburg in 1749. He studied composition at Padua under Padre Valotti, and became early in his life a very learned and ingenious practical musician. He travelled all over Europe, exhibiting in almost every capital and great city his talents on the organ, an instrument which he had made his peculiar study, particularly in the use of the pedals, and in producing new effects by the *crescendo* and *diminuendo*, not by the usual method of a common swell with pipes inclosed in a particular chest, but by boxing up the whole instrument, and increasing and diminishing the tone, not only of single stops, but of the entire chorus or full organ.

In 1776, he opened a music-school at Manheim, for organ-playing, for the harpsichord, and for composition. In 1780 he began his travels, went to Paris, performed to the king, queen, and royal family at Versailles, composed operas, and had several of his choral compositions performed at the concert spirituel. In 1786 he was appointed maestro di capella to the king of Sweden at Stockholm. But in 1790, after visiting Denmark, Germany, and Holland, he arrived in London, where he had pedals put to the organ in the Pantheon, before that beautiful building was burned down, and a general swell contrived for the whole instrument; and in a series of morning performances on that organ, shewed his dexterity in the use of the pedals, not only in the *crescendo* and *diminuendo*, but in innumerable imitations, many of which were thought imaginary, and but for the ample promises and description in his bills of fare, would perhaps not have been discovered.

The science of this extraordinary musician was thought by some to degenerate into pedantry, and the splendid promises in his advertisements to border on *charletanerie*; so that his success was not equal in our country to his real merit. Had he promised and attempted less, the public would have been more just and even generous in the estimation of his talents; but having injudiciously promised seeming impossibilities, what was possible, and what he really did perform, was sullenly heard with an unwillingness to be pleased. What he really did achieve was often uncommon and well deserving of applause, though perhaps not so much as he expected.

His publications in different parts of Europe are innumerable; but those in theory savour so much of the marvellous, that, on the continent, they are become proverbial. So that when any thing extraordinary in music was proposed or advertised, musicians used to cry out, oh! this is *à la Vogler!*

His advertisement in Holland, concerning an organ of his own construction, which he denominated an *orchestrion*, surpasses the marvellous of all the magnificent musical promises that we remember.

"The abbé Vogler, director of the Royal Academy of Music to his Swedish majesty, has constructed, after his own invention and design, (and at his own expence,) an organ with four rows of keys, sixty-three stops, thirty-nine pedals, and three swells, with proper resources to modify the sound: of which the first opens and shuts the general case of the pipes; the second, which is a pneumatic measure, stops the wind; the third divides and reunites the resources proportionably to the harmonic progression. The breadth, height, and depth of this organ is nine feet; the temperament of it is beyond conception exact. With respect to the body of tone, when in full chorus, it is equal to a church organ of sixteen feet. In depth of sound, it surpasses those of thirty-two feet; in sweetness, the *armonica*. Its *crescendo* governs all it plays; its *diminuendo* is qualified by the most minute gradations; and with respect to variety, the connoisseurs have declared, that a concert given by the abbé on his *orchestrion*, being a combination of all the instruments in Europe, and the result of thirty years' travelling, is the utmost extent of perfection possible in the art of playing and constructing organs."

His theoretical works are the following: 1. The Knowledge of Harmony, and its Use in Concert, Manheim, 1776, 8vo. 2. The Tuning Art, or System of Temperament. 3. His Course of Lectures delivered in his Harmonic School during three years. 4. A practical work for the Catholic church, entitled "Paradigma Modorum Ecclesiasticarum." 5. Ecce Panis, Chorus. 6. German Mass for the Organ. 7. Suscipit Israel, composed for the Concert Spirituel at Paris. 8. Four-part Fugues, upon the Stabat Mater of Pergolesi. 9. Psalmum Miserere decantandus 4 Vocib. cum Organ. et Bassis. S.D. Pio VI. pontifici compositus. Spire. 10. Vesperæ Chorales. Spire. For the theatre, The Merchant of Smyrna, an operette; and six more operas, serious and comic, to French words, at Paris. And works for the organ and piano forte, published throughout Europe, innumerable.

We believe that this active and indefatigable musician has at length become stationary in Denmark, and in the capital of that kingdom has been some time projecting new plans for the cultivation and improvement of music as a science, as well as a liberal and practical art.

VOGOGNA, in *Geography*. See UGOGNA.

VOGTLAND, a country included in the kingdom of Saxony, situated between the territory of Erzgebirg, Bohemia, the electorate of Saxony, and the principality of Culmbach. It is very hilly, and abounds in woods, but the former cannot be said to be altogether unfruitful, as producing either trees and plants, or being improved by tillage. In some parts likewise they yield copper, iron, lead, and silver, with other minerals, such as alum. Here is also no want of any kind of provisions; the fields affording grain and esculent herbs; the fine pastures in the valleys droves of excellent cattle, the woods plenty of venison and game, and the waters a variety of fish. The principal rivers are the Elster and the Saal. The name of Vogtland signifies the country possessed by the ancient advocates of the empire, who were predecessors to the present counts of Reussen. But the counts of Reussen at present enjoy only a part of it. The greatest part of this country belongs to the electoral house of Saxony. The margraves of Brandenburg Culmbach are possessed of the lordship of Hof, and the lordship of Ronneburg is vested in the house of

Saxe Gotha. What the name and dignity of a vogt imported in those ancient vogts of the empire is not yet agreed among the learned. One of the most probable conjectures is, that this dignity of a vogt was an hereditary office belonging to the empire, and the vogts themselves subordinate to the palatine of the Rhine, as arch-vogt of the empire. No less uncertainty exists concerning the epocha of this title, though it appears to have been used in the 11th century, the ancient statutes of the town of Weyda having been given to it in the year 1027, by Henry, vogt of Weyda. Towards the middle of the 14th century this title was discontinued.

VOGULES, a tribe or nation of Finns, who inhabit the western, and, in a greater degree, the eastern part of the northern Ural, and nomadize chiefly about the rivers which unite with the Irtysh and the Oby to the Frozen ocean, or with the Kama and the Volga into the Caspian, and therefore principally in the governments of Perma and Tobolsk: they call themselves Voguli, or according to M. Georgi Mansi, and are denominated by the Russians Vogulitschi. They allege their traditions in evidence of their having always resided where they are now found: and they came under the Russian sovereignty previously to the conquest of Siberia, at which time they were so brave and warlike, that they were with difficulty subdued. For some time they were thought to be the same with the Ostiaks; but in existing documents, which are more than 300 years old, they are specified as a distinct nation. All the stems of the Vogules, dispersed in various districts, taken collectively, compose a numerous nation, of unascertained population. The Vogules nomadizing in the circle of Tscherdyn, in the government of Perma, amounted in the year 1783 to no more than 111 persons, composing nine families, and so nearly related in consanguinity, that they were obliged to fetch women to be their wives from other races. Tooke's Russia, vol. i.

VOHBURG, a town of Bavaria; 10 miles E. of Ingoldstadt.

VOHEMARO BAY, a bay on the island of Madagascar. S. lat. 12° 25′. E. long. 51° 8′.

VOHENSTRAUS, or FOHENSTRAUS, a town of Bavaria, in the principality of Sulzbach; 8 miles E. of Weiden.

VOHIRIA, in *Botany*, Juss. Gen. 141, a barbarous name, altered, if not improved, from Aublet's *Voyria*. See LITA.

VOHL, or VOHLE, in *Geography*, a town of Hesse Cassel; 5 miles W. of Waldeck.

VOHLENBACH, a river which runs into the Lauchart, 2 miles N. of Voringen, in the principallity of Hohenzollern.

VOICE, VOX, in *Physiology*, a sound produced in the throat and mouth of an animal, by an apparatus of instruments for that purpose: or, it is the sound produced by the passage of the air through the rima glottidis of the larynx.

Voices are either *articulate* or *inarticulate*.

VOICES, *Articulate*, are those of which several conspire together to form some assemblage, or little system of sounds. Such are the voices expressing the letters of an alphabet, numbers of which, joined together, form words.

VOICES, *Inarticulate*, are such as are not organized, or assembled into words; such is the barking of dogs, the braying of asses, the hissing of serpents, the singing of birds, &c.

The formation of the human voice, with all its varieties observed in speech, music, &c. makes a very curious article of investigation; and the apparatus and organism of the vocal parts which contribute to the formation of musical tones, constitute a very complicated and surprising anatomical article of enquiry.

The structure and mechanism of the larynx adapted to this purpose are described under LARYNX; which see. But as the subject is curious and important, we shall here resume it, and furnish the reader with a connected detail of some observations, that may serve farther to elucidate this operation of nature. The human voice depends principally on the vibrations of the membranes of the glottis, excited by a current of air, which they alternately interrupt and suffer to pass; the sounds being also modified in their subsequent progress through the mouth. The parts subservient to the formation of sound are, the *trachea*, or wind-pipe, through which the air passes and repasses into the lungs; and which serves, as it were, for a bellows; the *larynx*, which is a short cylindrical canal, at the head of the trachea, particularly described, with its cartilages, &c. under that article; and the *glottis*, which is a little oval cleft, or chink, over which the epiglottis inclines backwards, as it ascends from its origin at the upper part of the thyroid cartilage. Within the glottis are extended its ligaments, contiguous to each other before, where they are inserted into the thyroid cartilage, and capable of diverging considerably behind whenever the aretynoid cartilages separate. These ligaments, as they vary their tension, in consequence of the motions of the aretynoid cartilages, are susceptible of vibrations of various frequency, and as they vibrate, produce a continuous sound. Properly speaking, there are two ligaments on each side; but this mode of operation is not fully understood; probably one pair only performs the vibrations, and the other assists, by means of the little cavity interposed, in enabling the air to act readily on them, and in communicating the vibrations again to the air.

The long canal of the trachea, terminated at the top with the glottis, appears so like a flute, that the ancients made no doubt but the trachea contributed the same to the voice, as the body of the flute does to the sound of that instrument. Galen himself fell, in some measure, into the mistake: he perceived, indeed, that the principal organ of voice was the glottis; but he still allowed the trachea a considerable share in the production of sound.

Galen's opinion was followed by all the ancients after him, and even by all the moderns, before M. Dodart. But that author observes, that we do not either speak or sing, when we inspire, or take in the air, but only when we expire, or expel it; and that the air, coming out of the lungs, passes always out of the minuter vesicles of that part into larger; and at last into the trachea itself, which is the largest of all: that thus its passage becoming still more free and easy, and this more than ever in the trachea, it can never undergo such a violence, and acquire such a velocity in that canal, as is required to the production of sound; but that, as the aperture of the glottis is very small, in comparison with the width of the trachea, the air can never get out of the trachea by the glottis, without a vast compression, and augmentation of its velocity; and that, by this means, in passing, it communicates a brisk agitation to the minute parts of the two lips of the glottis, and gives them a kind of spring, and occasions them to make vibrations; which, communicated to the passing air, are what really occasion the sound.

This sound, thus formed, proceeds into the cavity of the mouth and nostrils, where it is reflected and resounds; and on this resonance, M. Dodart shews, it is, that the agreeableness of the voice entirely depends. The different consistencies,

ſiſtencies, forms, &c. of the divers parts of the mouth, contribute to the reſonance, each in their way; and from this mixture of ſo many different reſonances in their due proportion, there reſults a melody in the human voice ſuperior and more affecting than it is in the power of the greateſt muſician to equal upon inſtruments. Hence it is, that when any of theſe parts are diſordered, *e. gr.* when the noſe is ſtopped, the voice becomes diſpleaſing.

The reſonance in the cavity of the mouth does not ſeem to conſiſt in a ſimple reflection, ſuch as that of a vault, &c. but in a reſonance proportionate to the tones of the ſound ſent into the mouth from the glottis; and, accordingly, we find this cavity to lengthen and ſhorten itſelf, according to the depth, or acuteneſs, of the tone.

Now, for the trachea to effect this reſonance, as it was the common opinion it did, it would be required, that the air, after its being modified, and turned into ſound, by the glottis, inſtead of continuing its courſe from within outwards, ſhould return from without inwards, and thus ſtrike on the ſide of the trachea; which can never happen, except in thoſe who have a violent cough, and in ventriloquous perſons. Indeed, in moſt river-fowl, which have a very ſtrong voice, the trachea does reſound; but the reaſon is, that in them the glottis is placed at the bottom of the trachea, and not at the top, as in men.

The canal, then, which at firſt paſſed for the principal organ of voice, is now found not to be ſo much as the ſecondary one, *i. e.* not that which occaſions the reſonance. It does not ſerve the glottis, as the body of the flute does its plug; but, inſtead of that, the mouth ſerves the glottis, as the body of ſome other wind-inſtrument not yet known in muſic. In effect, the office of the trachea is no other than that of the port-vent in an organ; *viz.* to furniſh wind.

The vowels and ſemivowels are continuous ſounds, chiefly formed by this apparatus in the glottis, and modified either in their origin or in their progreſs by the various arrangements of the different parts of the mouth. Of ſimple vowels, ſixteen or eighteen may be enumerated in different languages: in the French naſal vowels, the ſound is in part tranſmitted through the noſtrils, by means of the depreſſion of the ſoft palate: the perfect ſemivowels differ from the vowels only in the greater reſiſtance which the air undergoes in its paſſage through the mouth; there are alſo naſal and ſeminaſal ſemivowels. The perfect conſonants may be either exploſive, ſuſurrant, or mute; the exploſive conſonants begin or end with a ſound formed in the larynx, the others are either whiſpers, or mere noiſes, without any vocal ſound. By attending to the various poſitions of the organ, and by making experiments on the effects of pipes of different forms, it is poſſible to conſtruct a machine which ſhall imitate very accurately many of the ſounds of the human voice; and this has indeed been actually performed by Kratzenſtein and by Kempelen.

A kind of experimental analyſis of the voice may be thus exhibited. By drawing in the breath, and at the ſame time properly contracting the larynx, a ſlow vibration of the ligaments of the glottis may be produced, making a diſtinct clicking ſound: upon increaſing the tenſion, and the velocity of the breath, this clicking is loſt, and the ſound becomes continuous, but of an extremely grave pitch: it may, by a good ear, be diſtinguiſhed two octaves below the loweſt A of a common baſe voice, conſiſting in that caſe of about twenty-ſix vibrations in a ſecond. The ſame ſound may be raiſed nearly to the pitch of the common voice; but it is never ſmooth and clear, except perhaps in ſome of thoſe perſons called ventriloquiſts. When the pitch is raiſed ſtill higher, the upper orifice of the larynx, formed by the ſummits of the aretynoid cartilages and the epiglottis, ſeems to ſucceed to the office of the ligaments of the glottis, and to produce a retrograde falſetto, which is capable of a very great degree of acuteneſs. The ſame difference probably takes place between the natural voice and the common falſetto: the rimula glottidis being too long to admit of a ſufficient degree of tenſion for very acute ſounds, either the upper orifice of the larynx ſupplies its place, or ſome other ſimilar change is produced; hence, taking a note within the compaſs of either voice, it may be held, with the ſame expence of air, two or three times as long in a falſetto as in a natural voice; hence, too, ariſes the difficulty of paſſing ſmoothly from the one voice to the other. It has been remarked, that the larynx is always elevated when the ſound is acute: but this elevation is only neceſſary in rapid tranſitions, as in a ſhake; and then probably becauſe, by the contraction of the capacity of the trachea, an increaſe of the preſſure of the breath can be more rapidly affected this way, than by the action of the abdominal muſcles alone. The reflection of the ſound, thus produced from the various parts of the cavity of the mouth and noſtrils, mixing at various intervals with the portions of the vibrations directly proceeding from the larynx, muſt, according to the temporary form of the parts, variouſly affect the laws of the motion of the air in each vibration; or, according to Euler's expreſſion, the equation of the curve conceived to correſpond with this motion, and thus produce the various characters of the vowels and ſemivowels. The principal ſounding-board ſeems to be the bony palate: the noſe, except in naſal letters, affords but little reſonance; for the naſal paſſage may be cloſed, by applying the finger to the ſoft palate, without much altering the ſound of vowels not naſal. A good ear may diſtinctly obſerve, eſpecially in a loud baſe voice, beſides the fundamental note, at leaſt four harmonic ſounds, in the order of the natural numbers; and, the more reedy the tone of the voice, the more eaſily they are heard. Faint as they are, their origin is by no means eaſy to be explained. This obſervation is preciſely confirmed, in a late diſſertation of M. Knecht, publiſhed in the muſical newſpaper of Leipſic. Perhaps, by a cloſe attention to the harmonics entering into the conſtitution of various ſounds, more may be done in their analyſis than could otherwiſe be expected. Young's Philoſophy, vols. i. and ii.

Voice, *For the Cauſe of the different Tones of.* As the organs that form the voice make a kind of wind-inſtrument, we might expect to find in this inſtrument ſome proviſion anſwerable to that which produces the differences of tones in ſome other wind-inſtruments. The tone, therefore, muſt be attributed either to the mouth and noſtrils, which occaſion the reſonance, or to the glottis, which produces the ſound; and as all the different tones are produced in man by the ſame inſtrument, it follows, that the part which produces them muſt be capable of ſimilar inſtrumental changes.

Now, for a grave tone, we know there is more air required than for an acute one. The trachea, therefore, to let this greater quantity paſs, muſt dilate and ſhorten itſelf; by which ſhortening, the external canal, that is, the canal of the mouth and noſe, reckoned from the glottis to the lips, or noſtrils, is lengthened. For, the ſhortening of the internal canal, *i. e.* of the trachea, brings the larynx and glottis lower down; and, of conſequence, makes its diſtance from the mouth, &c. greater; and there is a change in the length of each canal, for every change of tone and ſemitone. Accordingly, it is eaſy to obſerve, that the knot of the larynx alternately riſes and falls in all diviſions, ſhakes,

ſhakes, or rapid changes of intervals in ſinging, however ſmall may be the difference of tone.

Hence, as the depth of the tone of an hautbois is anſwerable to the length of the inſtrument; the longeſt fibres of the wood, whoſe vibrations make the reſonance, making always the ſloweſt vibrations, and conſequently the deepeſt tone, it may appear probable, that the concavity of the mouth, by its lengthening for grave tones, and ſhortening for acute ones, might ſerve very well for the production of the divers tones; but M. Dodart obſerves, that in the ſtop of the organ called the *human voice*, the longeſt pipe is ſix inches; and yet, with all that length, it does not make any difference of tone; but the tone of the pipe is preciſely that of the plug: whereas the concavity of the mouth of a man of the graveſt voice, not being above ſix inches deep, it is evident that cannot modify, vary, and give the tone.

It is the glottis, then, that forms the tone, as well as the ſound; and the manner of forming the various tones is by varying its aperture: a piece of mechaniſm too admirable not to be here particularly inquired into.

The human glottis, then, repreſented in *Plate* XXIV. *Miſcellany*, *fig.* 9. is only capable of one proper motion; *viz.* that of an approach of its lips A D B, and A D B. Accordingly, the dotted lines A E B, A F B, A G B, exhibit three different degrees of approach. Theſe different apertures of the glottis anatomiſts uſually attribute to the action of the muſcles of the larynx; but M. Dodart ſhews, from their poſition, direction, &c. that they have other uſes; and that the opening and ſhutting of the glottis is effected by other means, *viz.* by two tendinous cords, or ſtrings, incloſed in the two lips of that aperture.

In effect, each of the two ſemicircular membranes, whoſe interſtice forms the glottis, is doubled back upon itſelf; and within each duplicature there is a cord, or ſtring, which is faſtened at one end of the fore-part of the larynx, and to the hind-part at the other. It is true, they appear more like ligaments than muſcles, as conſiſting of white and membranous fibres, not of red and fleſhy ones; but the vaſt number of minute changes in this aperture neceſſary to form the vaſt variety of tones, make an extraordinary kind of muſcle, by whoſe contraction they ſhould be effected, abſolutely neceſſary. Common fleſhy fibres, in which the blood is received in large quantity, had been infinitely too coarſe for ſuch delicate motions.

Theſe ſtrings, which, in their ſtate of relaxation, make each a little arc of an ellipſis, as they contract more and more, become longer, but leſs and leſs curve; and at laſt, with the greateſt contraction they are capable of, they degenerate into two right lines, applied cloſe to each other; ſo cloſe, and ſo firm, that an atom of air cannot eſcape out of the lungs, how full ſoever they may be, and how great an effort ſoever all the muſcles of the lower venter may make againſt the diaphragm, and, by the diaphragm, againſt theſe two little muſcles.

The different apertures of the lips of the glottis, then, produce all the different tones in the ſeveral vocal parts of muſic; *viz. baſe*, *baritono*, *tenor*, *counter-tenor*, and *trebles*; and the manner is thus:

The voice, we have ſhewn, can only be formed by the glottis; but the tones of the voice are modifications of the voice; and theſe can only be produced by the modifications of the glottis. Now the glottis is only capable of one modification, which is the mutual approach, or receſs of its lips: it is this, therefore, that produces the different tones. Now that modification includes two circumſtances: the firſt and principal is, that the lips are ſtretched more and more, from the loweſt tone to the higheſt; the ſecond is, that the more they are ſtretched, the nearer they approach.

From the firſt it follows, that their vibrations will be ſo much the quicker, as they come nearer their higheſt tone; and that the voice will be juſt, when the two lips are equally ſtretched; and falſe, when they are unequally; which agrees perfectly well with the nature of ſtringed-inſtruments.

From the ſecond it follows, that the higher the tones are, the nearer will they approach to each other; which agrees perfectly well with wind-inſtruments governed by reeds or plugs.

The degrees of tenſion of the lips are the firſt and principal cauſe of tones; but their differences are inſenſible. The degrees of approach are only conſequences of that tenſion; but their differences are more eaſily aſſigned.

To give a preciſe idea of the thing, therefore, we had beſt keep to that, and ſay, that this modification conſiſts in a tenſion, from whence reſults a very numerous ſubdiviſion of a very ſmall interval: which yet, ſmall as it is, is capable, phyſically ſpeaking, of being ſubdivided infinitely.

The doctrine is confirmed from the different apertures found in diſſecting perſons of different ages, of both ſexes. The aperture is leſs, and the exterior canal always ſhallower, in the ſex and ages fitteſt to ſing treble. Add, that the reed of a hautbois, ſeparated from the body of the inſtrument, being a little preſſed between the lips, will yield a tone ſomewhat higher than its natural one; and if preſſed ſtill more, will yield another ſtill higher: and thus an able muſician may run ſucceſſively through all the tones and ſemitones of an octave. They are different apertures, then, that produce, or, at leaſt, that accompany, different tones, both in natural wind-inſtruments and artificial ones; and the diminution of the aperture raiſes the tones both of the glottis, and the reed.

The reaſon why leſſening the aperture heightens the tone is, that the wind paſſes through it with the greater velocity; and from the ſame cauſe it is, that if any reed or plug, of an inſtrument, be too weakly blown, its tone will be lower than ordinary.

Indeed the contractions and dilatations of the glottis muſt be infinitely delicate: by an exact calculation of the ingenious author above-mentioned, it appears, that to perform all the tones and ſemitones of a common voice, which is computed to reach twelve tones; to perform all the particles and ſubdiviſions of thoſe tones into commas, and other minuter, though ſtill ſenſible parts; to perform all the ſhakes, or the differences in a tone when ſounded more or leſs ſtrong, without changing the tone; the little diameter of the glottis, which does not exceed one-tenth of an inch, but which varies within that extent at every change, muſt be actually divided into 9632 parts; which parts are yet very unequal, and, therefore, many of them much leſs than the [illegible]th part of an inch: a delicacy ſcarcely to be matched by any thing but a good ear, which has ſo juſt a ſenſe of ſound, as, naked, to perceive differences in all theſe tones; even thoſe whoſe origin is much leſs than the 963200th part of an inch.

With reſpect to the organ of voice, Rouſſeau, in 1768, when he publiſhed his Muſical Dictionary, was able to find no more ſatisfactory account than that which he has given from Duclos and Dodart; nor have we ſince been able to find that any further progreſs has been made into this myſtery of nature. We have converſed with the late Dr. William Hunter, and his brother, the great anatomiſt, Mr. John Hunter, on the ſubject, who agreed that there was no work of nature more ſubtile and inexplicable than the form-

ation of a fine musical voice; and agreed, that it was impossible, from any external appearance or dissection, to discover the least difference in the vocal organ of an individual who had been possessed of a fine voice, and of one who had no voice at all, but for speech; of a voice of high pitch or low; of a voice of extensive or contracted compass.

The great Haller combated the system of Dodart, and gave a very scientific and anatomical theory of his own; but not more intelligible and satisfactory to common readers than that of Dodart.

Buffon was of opinion, that those who sung out of tune heard better with one ear than the other; that those who sung in falset closed the larynx, and narrowed the passage of the voice; by which means octaves were produced, as in the flute and hautbois, by blowing with more force for the high notes than the low, with the same ventages open or closed.

The falset voice is literally *voce da testa*, and formed in the throat; never like the notes formed in the chest, called *voce di petto*.

This subject, one of the most curious in physiology, has tempted us to extend the article beyond our intention or usual limits: we must not yet, however, quit the subject.

The organ of voice had been always regarded by anatomists and natural philosophers as a wind-instrument, till the time of M. Ferrein, who, in 1741, presented a memoir to the Academy of Sciences at Paris, to prove it to be a stringed instrument, played on by the wind, which serves as a bow. An allusion, however, to the Æolian harp would have been more happy, than to a violin. The Æolian harp (see ÆOLUS's *Harp*) was well known in England about this time. An idea of it, too, might have been seen in Kircher's Musurgia, quoted by M. Ferrein for other purposes; and it was thence that Thomson the poet took it, who wrote an ode on this aerial instrument, which was set to music, and performed at a morning concert at viscountess Townshend's, mother of the present marquis. The ode is in Dodsley's Collection, and in Thomson's Works. Oswald, the celebrated player of old Scots tunes on the violoncello, and composer of many new, passed for the inventor of the Æolian harp; but as he was unable to read the account of it in the Musurgia, written in Latin, Thomson gave him the description of it in English, and let it pass for his invention, in order to give him a better title to the sale of the instrument at his music-shop in St. Martin's Church-yard.

M. Ferrein was of opinion, that there are strings in the lips of the glottis, capable of lengthening and shortening, and vibrating and sounding, like those of stringed instruments. His opinion surprises at first, and seems paradoxical; but he has supported it by experiments, which cannot easily be eluded. According to him, the organ of voice is at once a stringed and a wind-instrument. The air which comes from the lungs, and which passes through the glottis, performing the office of a bow upon the tendinous fibres of its lips, M. Ferrein calls *vocal strings* or *ribands* of the glottis. By the violent collision of the air against these vocal strings, they are put in motion; and it is by their quick and slow vibrations that they produce tones differing in gravity and acuteness, in proportion as they are more or less extended, according to the common and well-known laws of stringed instruments.

M. Ferrein has made a thousand experiments before the Academy, and individuals, in confirmation of his doctrine, as well upon the human subject as upon different animals. He took the *trachea arteria* from the dead body of a man destined for dissection, with his larynx, and blew into the *trachea*, holding at the same time the ribands, as he calls them, of the glottis lengthened or shortened, and the human voice was heard to rise or fall in tone, or remain stationary, in proportion to these circumstances.

And it is very remarkable, that, contrary to the expectation of M. Ferrein, the different voices produced, in the course of these experiments, were so like those of the particular animals upon whose organs they were made, that they were always to be discovered and distinguished one from the other. The roaring of a bull, the cry of a dog in pain, &c. were constantly discoverable, notwithstanding the want of innumerable parts used in modifying these sounds in living animals, such as the palate, the teeth, lips, &c. The larynx torn from the animal was usually mutilated, and sometimes without the epiglottis, as well as all the bits of cartilages surrounding or covering the glottis and vocal strings, which were removed in order to exhibit more plainly the visible play and vibrations of these strings; and notwithstanding all these defects, the voice of each animal preserved almost every peculiarity of sound which distinguishes it from that of other animals.

M. Ferrein says, that the necessary tension, or lengthening and shortening of the vocal strings, for the purpose of forming the whole extent of the human voice, is not above two or three lines, or twelfth parts of an inch.

In common stringed instruments, lengthening a string makes it flatter, or of a tone more grave; and shortening it has a contrary effect: but with respect to these vocal strings it is quite different; for they are rendered more acute by being lengthened, as at the same time their tension is increased.

Many have gone through M. Ferrein's experiments with success; though Haller says that he himself was not so happy, not having been able to produce different voices of animals, as others had done, by blowing on the ribands. (See Eloge de M. Ferrein, in the Hist. de l'Acad. Royal des Sciences for the year 1769, published 1772, p. 15.) M. Ferrein was a physician and professor of anatomy and surgery, who died at Paris in 1769.

If a pipe could be formed to resemble the vocal organ, as described by M. Ferrein, we might hope for a true and exact imitation of the human voice, which has never yet been attained, owing perhaps to the mistaken notion of the voice being a kind of flute or mere wind-instrument.

VOICE, in *Grammar*, is a circumstance in verbs, by which they come to be considered as either active or passive, *i. e.* either as expressing an action impressed on another subject; as, *I beat:* or receiving it from another; as, *I am beaten*.

The Greeks have a third voice, called medial, because it has sometimes an active, and sometimes a passive signification.

VOICE, in matters of election, denotes a *vote*, or *suffrage*. In this sense, a man is said to have a *deliberative* voice, when he has a right to give his advice and opinion in a matter of debate, and his suffrage is taken; an *active* voice, when he gives his vote for the election o. any one; and a *passive* voice, when the suffrages may fall on himself to be elected; an *excitative* voice, when he may act to procure another to be elected; a *consultative* voice, when he can only offer reasons and remonstrances, on which the chief, or head, determines at his own discretion: such the cardinals have, with regard to the pope; and the masters in chancery, with regard to the lord chancellor, &c.

VOICE, in *Oratory*, is one of the parts of pronunciation, upon the proper regulation of which much of the orator's success

ſuccefs depends. For this purpoſe it will be right to obſerve, in general, what nature does, when free and unconſtrained. As perſons are differently affected when they ſpeak, ſo they naturally alter the tone of their voice: it riſes, ſinks, and has various inflexions given it, according to the preſent ſtate and diſpoſition of the mind. When the mind is calm and ſedate, the voice is moderate and even; when the former is dejected with ſorrow, the latter is languid; and when that is inflamed by paſſion, this is raiſed and elevated. It is the orator's buſineſs, therefore, to follow nature, and to endeavour that the tone of his voice appear natural and unaffected: and for this end, he muſt take care to ſuit it to the nature of the ſubject; but ſtill ſo as to be always grave and decent.

The principal affections or properties of the voice may be referred either to *quantity* or *quality*. The quantity of the voice conſiſts in its highneſs or lowneſs, ſwiftneſs or ſlowneſs, and the intermediate degrees between them. Every perſon who ſpeaks in public ſhould endeavour, if he can, to fill the place where he ſpeaks, without exceeding the natural key of his voice; in which caſe it will be either harſh and rough, or too ſhrill and ſqueaking; nor will he be able to give every ſyllable its full and diſtinct ſound, and to inflect it properly. He ſhould alſo take care, that it does not ſink too low, which will give him pain to raiſe it again to its proper pitch, and be no leſs offenſive to the hearers. The laſt word of a ſentence ought, in a particular manner, to be expreſſed diſtinctly, becauſe the meaning of the whole ſentence often depends upon it. The medium between theſe two is a moderate and even voice, which every perſon muſt regulate by the natural key of his own voice. But this equality of voice muſt be accompanied with a variety of inflexions and changes within the ſame pitch; and the gradations, whether higher or lower, muſt be gentle and regular; the voice moving from one key to another, ſo as rather to glide like a gentle ſtream than pour down like a rapid torrent; and the degree of theſe inflexions and various tones of voice ſhould differ according to the nature of the ſubject, and deſign of the ſpeaker.

The next property of the voice is ſwiftneſs; and with regard to this, care ſhould be taken to avoid the two extremes of hurrying precipitately without pauſing, which deſtroys not only the neceſſary diſtinction between ſentence and ſentence, but likewiſe between the ſeveral words of the ſame ſentence; and of ſpeaking ſo ſlowly, as to argue a heavineſs in the ſpeaker, and to render the diſcourſe flat and lifeleſs.

In order to avoid both theſe extremes, the voice ought to be ſedate and diſtinct; for which purpoſe it is neceſſary, not only that each word and ſyllable ſhould have its full and juſt ſound, both as to time and accent, but likewiſe that every ſentence, and part of a ſentence, ſhould be ſeparated by its proper pauſe and interval. See Pause.

Thoſe properties of the voice, that reſpect its *qualities*, are chiefly ſtrength or weakneſs, clearneſs or obſcureneſs, fullneſs or ſmallneſs, ſmoothneſs or roughneſs. Temperance is a great preſervative of the voice in all theſe reſpects, and all exceſs is highly prejudicial to it. A ſtrong voice is very ſerviceable to the orator, becauſe, if he wants ſome other advantages, he is however able to make himſelf heard; and if he is forced to ſtrain it, he is leſs in danger of its failing him, before he has finiſhed his diſcourſe. But he who has a weak voice ſhould be careful not to ſtrain it, eſpecially at firſt: he ought to begin low, and riſe gradually to ſuch a pitch, as the key of his voice will carry him, without being obliged to ſink again afterwards. Frequent inflexions of the voice will likewiſe relieve him; and he ſhould ſpeak deliberately, and eaſe his voice, by allowing due time for reſpiration at all the proper pauſes.

A voice is ſaid to be clear, when the organs of ſpeech are ſuited to give every ſingle letter, and all the combinations of them in ſyllables and words, their proper and diſtinct ſound. Such a voice is agreeable to the hearers, and advantageous to the ſpeaker; as by ſpeaking moderately, he may be diſtinctly heard, and thus be able to modulate his voice at pleaſure.

An obſcure and confuſed voice is ſometimes owing to a deficiency in the organ, but often it is the effect of bad habit, acquired either by miſplacing the accent, confounding the ſound of the letters, or huddling the ſyllables one upon another, ſo as to render what is ſaid unintelligible. When this confuſed voice ariſes from a natural defect, it may be remedied, as well as weakneſs of voice, in the manner purſued by Demoſthenes. See Pronunciation.

But the moſt likely way of mending faults proceeding from bad habit, is to ſpeak deliberately.

A full voice is not the ſame as a ſtrong or a loud voice; it fills the ear, but it is often not pleaſant; and, therefore, to render it ſo, as well as audible, it ſhould be frequently varied. Thoſe who have the misfortune of a very ſmall voice, ſhould be cautious of raiſing it to too high a pitch, eſpecially at once; becauſe the ſudden compreſſure of the organ is apt to occaſion a ſqueaking and very diſagreeable ſound. A ſoft and ſmooth voice is of all the moſt muſical, eſpecially if it be flexible; and, on the contrary, nothing is leſs harmonious than a voice that is harſh and rough.

Upon the whole, we may conclude that voice to be the beſt or fitteſt for an orator, which is moderate, diſtinct, firm, clear, and ſmooth, and alſo eaſily flexible to the ſeveral degrees and variations of ſound, which every part of the diſcourſe may require. The different parts of a diſcourſe require correſponding modulations of the voice. The orator ſhould ſpeak low at firſt, becauſe this has the appearance of modeſty, engages attention, and is beſt for the voice. In the narration, the voice ought to be raiſed to ſomewhat a higher pitch. The propoſition, or ſubject of the diſcourſe, ſhould be delivered with a very clear and audible voice. The confirmation admits of great variety, both of the voice and geſtures: in reaſoning, the voice is quick and pungent, and ſhould be enforced with ſuitable actions; and in deſcriptions, whilſt the orator is pointing out the images of things, he ſhould ſo endeavour to adapt both his voice, and the motions of his body, particularly the turn of his eyes, and action of his hands, as may beſt help the imagination of his hearers. Where he introduces another perſon ſpeaking, or addreſſes an abſent perſon, it ſhould be with ſome degree of imitation; and in dialogue, the voice ſhould alter with the parts. When he diverts from his ſubject by any digreſſion, his voice ſhould be lively and cheerful; ſince that is rather deſigned for entertainment than inſtruction. In confutation, the arguments of the adverſe party ought firſt to be repeated in a plain and diſtinct manner, unleſs they appear unworthy of a ſerious anſwer; and then a facetious manner, both of expreſſion and geſture, may be the moſt proper way to confute them. In the concluſion, both the voice and geſture ſhould be briſk and ſprightly.

There are ſometimes certain words, which require an emphaſis and diſtinction of the voice: ſuch are often pronouns, as *this is the man*; and many words that denote the circumſtances and qualities of a thing, ſome of which heightening or magnifying the idea of the thing to which they are joined, elevate the voice, and others debaſing or leſſening it, depreſs the voice, or at leaſt protract the tone.

 Some

Some tropes likewise, as metaphors, and verbal figures, which consist in the repetition of a single word, should have a particular emphasis.

In sentences, regard should be had to their length, and the number of their parts, in order to distinguish them by proper pauses. The frame and structure of the period ought likewise to be considered, that the voice may be so managed, as to give it the most musical accent. Unless there be some special reason for the contrary, it should end louder than it begins. In an antithesis, one contrary must be louder than the other; in a climax, or gradation, the voice should rise with it.

As to the passions, it is evident that each of them requires a different voice and action. Love and esteem are expressed in a smooth and cheerful tone; but anger and resentment with a rough, harsh, and interrupted voice. Joy raises and dilates the voice; as sorrow sinks and contracts it. Fear occasions a tremor and hesitation of the voice; and assurance gives it strength and firmness. Admiration elevates the voice, and should be expressed with pomp and magnificence; the expression of it being often accompanied with an elevation both of the eyes and hands: on the contrary, contempt sinks and protracts the voice.

All exclamations should be violent. When we address inanimate things, the voice should be higher than when we address animated beings; and appeals to heaven must be made in a loftier tone than those to men.

After all, it is impossible to gain a just and decent pronunciation of voice and gesture, merely from rules, without practice, and an imitation of the best examples. Ward's Orat. vol. ii. lect. 48. and lect. 50.

Voice, *Part of the*, in *Music*. See Part.

Voice *of a Singer, Accidents and Disorders to which it is liable*. The air received in the lungs, and expelled by compression of the chest, passing through the aperture of the larynx gently closed, produces a sound, which afterwards, by the modulation of the tongue and other parts of the mouth, form the voice of a singer; and as many things concur in this formation, such as the breast, the diaphragm, the lungs, the wind-pipe, the uvula, or palate, the tongue, the teeth, and the mucosity which lubricates the several parts, all subject to a number of acute and chronical disorders, which, though it may not be necessary to specify here, it seems expedient that vocal performers should be apprised of the accidents to which the voice is liable, to put them on their guard; and the public, to incline them to pity and tolerate what the utmost care cannot always avoid.

Natural defects in the voice are incurable, such as being of a coarse quality, husky, inflexible, and out of tune.

VOID, in *Geography*, a town of France, in the department of the Meuse; 10 miles W. of Toul.

Void, in *Common Law*. See Annulling.

Void *Bastion*. See Bastion.

Void *Space*, in *Physics*. See Vacuum, &c.

VOIDANCE, Vacancy, in the *Canon Law*, a want of an incumbent upon a benefice. See Vacancy, &c.

This is twofold; either in law, *de jure;* as when one holds several benefices that are incompatible; or *de facto*, in deed; as when the incumbent is dead, or resigns, or is actually deprived.

VOIDED, Vuide, in *Heraldry*, is understood of an ordinary whose inner or middle part is cut out, leaving nothing but its edges to shew its form; so that the field appears through it. Hence, it is needless to express the colour, or metal, of the voided part; because it must, of course, be that of the field.

Voided, *The Cross*, differs from the cross *fimbriated*, in that this latter does not shew the field through it, as the other does. And the same obtains in other ordinaries.

VOIDER, one of the ordinaries, whose figure is much like that of the flasque, or flanch; only that it doth not bend so much.

This armoury, they say, is properly the reward of a gentlewoman that has well served her prince. It is always borne by pairs.

Voider, in *Agriculture*, a term provincially applied, in some instances, to a sort of open-work shallow basket or sieve, in which different articles of farm produce are put, in order to be out of the way.

VOIDING, Evacuating, in *Medicine*. (See Evacuation.) In the Philosophical Transactions we have an account of one Matt. Milford, who voided a worm by urine, supposed to have come from the kidneys.

Dr. Lister mentions true caterpillars voided by a boy of nine years old. Mr. Jessop saw hexapods vomited up by a girl. Catharina Geilaria, who died in 1662, in the hospital of Altenburg, for twenty years voided, they say, by vomit and stool, toads and lizards. Ephem. German. tom. i. obs. 103.

In the same Ephem. is also a story of a kitten, bred in the stomach, and vomited up; and others of whelps, frogs, lacertæ aquaticæ, and other animals, bred and voided the like way. Bartholine gives us an instance of a worm bred in the brain, and voided by the nose of O. W. See Worms.

VOIGTIA, in *Botany*, Roth in Roem. and Ust. Mag. fasc. 10. 17, 196. Poiret in Lamarck Dict. v. 8. 683; see Rothia.

VOIGTSBERG, in *Geography*, a town and citadel of Saxony, which gives name to a prefecturate in the Vogtland; 1 mile N. of Oelnitz.

VOIR Dire, in *Law*. When, upon a trial at law, it is prayed, that a witness may be sworn upon a *voir dire*, the meaning is, that he shall, upon his oath, speak or declare the truth, whether he shall get or lose by the matter in controversy. If he be unconcerned, his testimony is allowed, otherwise not.

VOIRE, in *Geography*, a river of France, which runs into the Aube, near Chalette.

VOIRON, a town of France, in the department of the Isere; 10 miles N.W. of Grenoble.

VOISENON, Claude Henry de Fusée du, in *Biography*, a literary person of singular character, was born at the chateau of Voisenon, near Melun, in 1708, and educated for the ecclesiastical profession. He commenced his career of advancement by being grand-vicar to the see of Boulogne; but having fought a duel, he afterwards contented himself with the abbacy of Jard, which was probably a family benefice. He was of a lively, humorous disposition, and as he knew how to trifle agreeably, he was admitted into fashionable society. As a writer, he published several romances, the best of which is said to be a kind of moral tale, entitled "L'Histoire de la Felicité." His comedies of "Marriages assortis," 1744, and "La Coquette fixée," 1746, are reckoned to contain strokes of humour which would not have been disavowed even by Moliere. He was also the author of many fugitive pieces. His literary reputation caused him to be elected into the French Academy; and the duke of Choiseul settled on him a pension of 6000 livres to write a French history. He died in 1775, and his works were collected in 1782 by his friend, Mad. de Turpin, in 5 vols. 8vo. Nouv. Dict. Hist.

VOISEY, in *Geography*, a town of France, in the department of the Upper Marne; 6 miles S.E. of Bourbon les Bains.

VOISHA, a town of Servia; 48 miles W. of Jenibasar.

VOISIN, Joseph de, in *Biography*, a theological writer, was born at Bourdeaux, of a family distinguished in the department of law, but his disposition being devotional, he abandoned the legal for the ecclesiastical profession, and obtained priest's orders, and the degree of doctor in theology. He was a good Hebrew scholar, and very conversant with Rabbinical literature. In 1635 he published a Latin translation of a Rabbinical work on the soul; and in 1647 he gave to the public "Theology of the Jews," in Latin, 4to., and afterwards a "Treatise on the Jewish Jubilee," and other works of a similar kind. He was the editor, and partly author, of the work of the prince of Conti against theatrical spectacles, 1666; and after the death of that prince, of a defence of it against the abbé d'Aubignac. His translation of the Roman Missal into French was printed in 1660; but at the instigation of cardinal Mazarin, it was condemned by an assembly of the French clergy, though it had obtained the sanction of some bishops and doctors in theology. The plea urged against it was its being an attempt to prepare for the celebration of mass in French, and it was suppressed by a decree of the council. The grand-vicar of Paris sanctioned the printing and sale of the work; but the king enforced the pope's brief, which prohibited a translation of the Missal. Voisin afterwards obtained a royal privilege for its impression. This learned and pious person died in 1685. Moreri.

VOISINNES, in *Geography*, a town of France, in the department of the Upper Marne; 6 miles W. of Langres.

VOITEUR, a town of France, in the department of the Jura; 6 miles N. of Lons le Saunier.

VOITSBERG, or Woitssberg, a town of the duchy of Stiria, on the Kainach; 20 miles W.S.W. of Gratz. N. lat. 47° 4'. E. long. 15°.

VOITURE, Vincent, in *Biography*, born at Amiens in the year 1598, was a lively French writer, and an agreeable companion in the fashionable circles. At the court of Lewis XIII. he was well received, whose brother, Gaston, duke of Orleans, made him master of the ceremonies, and introducer of foreign ambassadors, and whom he followed in his retirement to Languedoc. In 1634 he was admitted into the French Academy, of which he was a distinguished member, as he was well acquainted with the Latin, Italian, and Spanish languages. He held the office of interpreter to the queen-mother, and was employed in several court commissions. At Madrid he ingratiated himself with the count d'Olivares, and for the gratification of his curiosity made a tour to Africa. His Spanish verses were taken for those of Lopez de Vega; and at Rome he was elected, on account of his Italian literature, a member of the Academy degli Umoristi. On his return to France, he was appointed maitre d'hotel to the king; and M. d'Avaux, superintendant of the finances, gave him the fine-cure place of his "commis." But all his preferments and pensions were not a sufficient fund for supplying him with the means of gaming and of gallantry. Being naturally feeble in his constitution, his various indulgencies were the occasion of terminating his life, in 1648, at the age of 50 years. His heart was good, but he was vain and irritable; and he had the meanness to be ashamed of his descent from a father who was a wine-merchant, so that he could not bear pleasantries that referred to his origin: and it was therefore said of him, that "wine, which raised other people's spirits, flattened his." Against those whom he provoked by his sarcasms, he had not courage to defend himself; and therefore, when he once offended a court lord, and was ordered to draw his sword, he replied, "the match is not equal: you are tall, and I am short; you are brave, and I am a poltroon; you want to kill me: well then! I reckon myself dead." By this kind of apology he disarmed his antagonists. His peculiar excellence, like that of Balzac, consisted in letter-writing, which he was very slow in executing, and in which he displayed much wit and pleasantry, often degenerating into affectation, and sometimes into indelicacy. His letters, however, notwithstanding their imperfections and faults, were much admired, and served as a passport into the politest companies. His poems were of a similar character to that of his letters. They consist of epistles, elegies, sonnets, rondeaus, ballads, and songs. For want of nature and correct taste, his works have sunk into oblivion. The latest edition is that of Paris, in 2 vols. 12mo. 1759. Moreri.

VOIVRE, La, in *Geography*, a town of France, in the department of the Vosges; 9 miles E. of Rembervіller.

VOJUSSA, a river of European Turkey, which runs into the Adriatic; 7 miles N. of Valona.

VOKINOSAMA, a town of Japan, in the island of Ximo; 18 miles N. of Funai.

VOKSA, a river of Russia, which runs from lake Saima to lake Ladoga, in the government of Viborg.

VOKSCHA, a river of Russia, which rises in the province of Ustiug, and joins the Mezen, in the government of Archangel; 16 miles N. of Olenskoi.

VOIX Celestine, in *Music*, a stop in the organ, an octave above the *vox humana*.

VOL, in *Ancient Geography*, a town of Africa Propria, S. of Carthage, between the rivers Bagradas and Triton. Ptolemy.

Vol, among *Heralds*, signifies the two wings of a fowl joined together, borne in armoury; as being the whole that makes the flight. Accordingly, a *demi-vol* is a single wing.

VOLA, the palm, or inside of the hand, comprehended between the fingers and the wrist.

VOLANA, in *Ancient Geography*, a river of Gallia Cisalpina, called also Podi Volana.—Also, a town of Italy, in Samnium.

VOLANDUM, a fortified place of Asia, in Armenia, and the strongest in the country. It was taken by Corbulo without the loss of a single man, and all the inhabitants above the age of fourteen years were consigned to the edge of the sword.

VOLANO, in *Geography*, a sea-port town of Italy, in the Ferrarese, at the mouth of the southern branch of the Po, which is called Po di Volano; 23 miles E. of Ferrara.

VOLANS. See Draco, and Piscis.

VOLANT, in *Heraldry*, is when a bird, in a coat of arms, is drawn flying, or having its wings spread out.

Volant, *Pass*. See Pass-volant.

Volant, *Pont*. See Pont-volant.

VOLAR, in *Geography*, a town of Transylvania; 4 miles S. of Hunyad.

VOLATA, Ital., in *Music*, a flight, rapid division, a rapid extemporaneous passage at a close, or pause.

VOLATERRÆ, in *Ancient Geography*, a town of Italy, in Etruria, at a certain distance from the sea, situated on a mountain, which, according to Strabo, was fifteen stadia in height. It is placed by some authors in the rank of the twelve cities of Etruria. After its subjection to the Romans, it remained faithful. In the time of Sylla's proscriptions, it was unsuccessfully besieged for two years. Its inhabitants obtained the right of Roman citizenship. At the fall of the empire it passed under the power of the Vandals, Huns, and Goths; but was retaken by Narses, in the year

553. Some authors say that for a certain time the Lombards fixed their court there.

VOLATERRANA Vada, a town or borough of Italy, in Etruria, with a port at the mouth of the Gecinna, according to Pliny. It is now called Vadi.

VOLATICA, in *Medicine*, a name given by authors to a sort of wandering pain, attended with a tumour, and affecting, at different times, different parts of the body. It is by some accounted a species of the scurvy; by others, of the leprosy.

VOLATILE, in *Physics*, is commonly used to denote a mixt body, whose integral parts are easily dissipated by fire or heat; but it is more properly used for bodies whose elements, or first component parts, are easily separated from each other, and dispersed in air.

As those bodies which by heat suffer no diminution of their weight are said to be fixed, so those which do lose of their weight are said to be volatile; and they are said to be more or less volatile, according as a greater or less degree of heat is requisite for producing a separation of their parts. Perhaps, indeed, every body is, rigorously speaking, volatile: but as there are some, the volatility of which can be only rendered sensible by the action of a fire much more violent than any which we can produce, we consider these bodies as being fixed, or not volatile.

Minerals, for the generality, are less volatile than vegetables; and vegetables are less so than animals.

The chemists distinguish between volatile salts and fixt salts. The capitals of aludels stop and collect the volatile parts of substances, in sublimation, and make what we call *flowers*.

"The particles of fluids which do not cohere very strongly together, and are of such smallness as renders them most susceptible of those agitations which keep liquors in a fluor, are easily rarefied into vapour; and, in the language of the chemists, are volatile. Those which are grosser, and by that means less susceptible of alterations, or which cohere by a stronger heat, or, perhaps, not without fermentation; these are what the chemists call fixt bodies." Newton's Optics, p. 371.

Volatile *Alkali*. See Alkali.

Volatile *Salt of Amber*. See Amber.

Volatile *Oil*, in *Rural Economy*, is that sort which has a fragrant aromatic smell, and which is sometimes called *essential* oil. It is stated by sir Humphrey Davy to differ from fixed oil, in being capable of evaporation by a much lower degree of heat, in being soluble in alcohol, and in possessing a very slight degree of solubility in water. There is a great number of this sort of oils, distinguished by their smell, their taste, their specific gravity, and other sensible qualities. A strong and peculiar odour may, however, be considered as the great characteristic of each sort; the volatile oils inflame with more facility than the fixed oils, and afford by their combustion different proportions of the same substances, water, carbonic acid, and carbon.

It is said that the peculiar odours of plants seem, in almost all cases, to depend upon the peculiar oils of this sort they contain. All the perfumed distilled waters owe their peculiar properties to the volatile oils they hold in solution. By collecting the aromatic oils, the fragrance of flowers, so fugitive in the common course of nature, is as it were embodied and made permanent. It cannot be doubted, it is said, that the volatile oils consist of carbon, hydrogen, and oxygen; but no accurate experiments have as yet been made on the proportions in which these elements are combined. As the fragrance of flowers depends upon the volatile oils they contain; and these oils, by their constant evaporation, surround the flower with a kind of odorous atmosphere; which, at the same time that it entices larger insects, may probably preserve the parts of fructification from the ravages of smaller ones; volatile oils, or odorous substances, seem, it is said, particularly destructive to these minute insects and animalcules which feed on the substance of vegetables: thousands of aphides may be usually seen in the stalk and leaves of the rose; but none of them are ever observed on the flower. Camphor is the substance used to preserve the collections of naturalists. The woods that contain aromatic oils are remarkable for their indestructibility, and for their exemption from the attacks of insects: this is particularly the case with the cedar, rose-wood, and cypress. The gates of Constantinople, which were made of this last sort of wood, stood entire, it is said, from the time of Constantine, their founder, to that of pope Eugene IV., a period of 1100 years.

This sort of oils is afforded by distillation, coming over with the water, and floating on the top of it in small globules. It is collected by pouring a quantity of the distilled water with the oil, as it comes over into a vessel, so constructed as to suffer the watery part to escape by a stop-cock near the bottom; the vessel or apparatus is again filled, and when settled, the water is again let out; in this manner the oil is collected in great quantities, floating as above. This essential or etherial oil resides, it is supposed by some, in a particular part of the plant, but which is different in different sorts. And it is said that the oils vary in their nature or properties in different sorts of plants.

It is noticed by the above writer, that the volatile oils have never been used as articles of food; many of them are employed in the arts, in the manufacture of pigments and varnishes; but that their most extensive application is as perfumes in the hands of the perfumer, and manufacturer in that way. On the contrary, the fixed oils are very nutritive substances, and are of great importance in their applications to the purposes of life. See Oil.

Volatile, *Sal Oleosum*. See Sal.

Volatile *Salt*. See Salt.

VOLATILISATION, or Volatilization, the act of rendering fixt bodies volatile, or resolving them, by fire, into a fine, subtle vapour, or spirit, which easily dissipates, and flies away.

All bodies, even the most fixt, as gold, may be volatilized, either of themselves, or with the admixture of some volatile substance, or spirit; by distillation, or sublimation.

In the Memoirs of the Royal Academy we have a discourse on the volatilization of the fixed salts of plants, by M. Homberg.

VOLATILITY, in *Chemistry*, is a property that many bodies have of being reduced into light vapours, which exhale when they are exposed to the action of fire. This quality is opposed to fixity, and is owing to the greater or less dilatability which bodies have, when exposed to fire. See Volatile, Sublimation, &c.

VOLCÆ Arecomici, in *Ancient Geography*, contradistinguished from the *Tectosages*, were a branch of a people, who occupied, in the Narbonnese province, the whole space that lies between the Rhone and the Garonne. The Arecomici were situated near the Rhone, and extended along the sea in that territory which is now called Lower Languedoc. When Hannibal traversed the southern part of Gaul, in his way to Italy, the Arecomici were not bounded by the Rhone, but possessed territory on both sides of the river. The chain of Mons Aberna separated the Arecomici from the Ruteni and the Gabati. But their limits with regard to the Tectosages are not easily ascertained. According

cording to Strabo, Narbonne was a part of the territory of the Arecomici; but Ptolemy extends the territory of the Tectosagea, so as to assign to them the towns of Narbonne, Beziers, and Cessero upon the Arur. Before the Romans made Narbonne the capital of their first province conquered in Gaul, this city might have belonged to the Arecomici rather than to the Tectosages, agreeably to Strabo's account. But when Narbonne was elevated to this dignity, it found itself independent of both classes of the Volcæ, and appropriated to itself a distinct and separate territory. This territory is indicated by the position of Fines, between Carcassonne and Toulouse. Ptolemy, however, not duly regarding the distinction between these several people, adjudged Narbonne and some other towns to the Tectosages rather than to the Arecomici, whose district was thus reduced to that of the capital, or of Nemausus in particular. The Volcæ Tectosages merit a particular distinction on account of the expeditions in which they engaged. They penetrated, according to Cæsar, into Germany, and established themselves in cantons of the forest of Herinia, acquiring the reputation of justice as well as of courage in war. Justin reports that a body of the Tectosages penetrated into Illyria, and fixed itself in Pannonia. But their most celebrated establishment was that in Phrygia, where they preserved their own name. They also occupied Ancyra, the principal town of the country, which took the name of Galatia. The Tectosages of the Narbonnese, according to Strabo, approached the Pyrenées, and attained one extreme of the declivity of mount Commenus or Cebanna. Their limit, with regard to the Arecomici, seems to have been determined by the position of Fines, of which we have already spoken.

VOLCANO, in *Geography*. See VULCANO.

VOLCANO, in *Geology*, is an opening made by subterranean fire in the surface of the earth, through which vapour, smoke, flames, and stones are ejected, with streams of melted stone, called lava. Some volcanoes throw out boiling water and mud.

Of all geological phenomena, volcanoes are the most impressive, as they not unfrequently change the appearance of a whole district in the course of a few days; and the only instances we have of the formation of rocks in our own times, are those produced by the agency of volcanic fires. In a former state of the globe, these fires appear to have been still more actively and extensively operative: this is proved by the numerous remains of extinct volcanoes of immense size, scattered over various parts of the world, and by the existence of rocks nearly resembling volcanic products, found in almost every country that has yet been explored. It is only within a short period that these phenomena have been attentively and accurately examined. We shall commence our account with a description of the external structure of volcanoes.

Many volcanoes are lofty mountains, surmounted by a truncated cone, having an aperture at the summit, nearly circular, and of greater or less depth, called the crater, from which the eruptions issue; but not unfrequently the eruptions burst from the side or the foot of the mountain, and they sometimes break forth at a great depth under the sea. The greatest number of active volcanoes are situated near the sea or large lakes, from which circumstance it has been supposed, by some geologists, that water is an agent in all volcanic eruptions. Most isolated volcanic mountains have a pyramidal or conical form, ascending at a moderate angle of inclination from the base to an elevated plain, from the centre of which rises the cone in which the principal crater is situated. The sides of this cone are generally steep, and are covered with volcanic sand, pumice, or scoriæ. The matter of which it is composed, as well as the shape, evidently indicate that it has been formed by substances thrown out of the volcano in a perpendicular direction, which in their descent have accumulated round the aperture, and from the laws of gravity have assumed a conical form. The shape of the cone is changed during great eruptions, sometimes they have been known to sink down and disappear, new volcanic cones forming in other parts of the mountain. A considerable part of the cone of Vesuvius fell down during the eruption of 1794. In 1727, when M. d'Orville visited Vulcano, one of the Lipari or Æolian isles, there were two distinct volcanic cones, each placed on an eminence, and containing a crater in a state of active eruption; whereas, at present, there is but one cone conspicuous in the island, the summit being single. Spallanzani, who visited these islands about sixty years after M. d'Orville, made inquiries of some of the oldest inhabitants respecting the double cone and crater of Vulcano, and he found some few persons who retained a recollection of it. The regular conical form does not characterize all volcanoes. The volcanic mountains in America, according to Humboldt, present a considerable diversity, both in shape and situation, from those in the old world.

In Europe and in Asia, as far as the interior of the latter continent is known, no burning volcano is situated in a chain of mountains; all being at a greater or less distance from these chains. In the new world, on the contrary, the volcanoes, the most stupendous for their masses, form a part of the Cordilleras themselves. The mountains of mica-slate and gniess, in Peru and New Granada, immediately touch the volcanic porphyries of the province of Quito and Pasto. To the south and north of these countries, in Chili and in the kingdom of Guatimala, the active volcanoes are grouped in rows. They are the continuation of the chains of primitive rocks; and if the volcanic fire has broken out in some plains far from the Cordilleras, as in mount Sangay and Jorullo, we must consider this phenomenon as an exception to the law which nature seems to have imposed on these regions.

The Peak of Teneriffe forms a pyramidal mass like Etna, Tungurahua, and Popocatapetl, but this character is far from being common to all volcanoes. We have seen, says Humboldt, some in the southern hemisphere, which, instead of having the form of a cone or bell, are lengthened in one direction, having the ridge sometimes smooth, at others rough, with small pointed rocks. This structure is peculiar to Antisan and Pichinca, two burning mountains of the province of Quito, and the absence of the conical form ought never to be considered as opposed to a volcanic origin.

M. Humboldt deduces the following inferences from his observations on the shape of different volcanoes. That mountains with slender conical peaks, are those which are subject to eruptions of the greatest violence, and at the nearest periods to each other. Mountains with lengthened summits, rugged, with small stony masses, are very old volcanoes nearly extinguished. Rounded summits, in the form of domes or bells, indicate those doubtful kinds of porphyries which are supposed to have been heated in their original place, and forced up in a softened state without ever having flowed as lavas. To the first of these mountains belong Cotopaxi, the Peak of Teneriffe, and that of Orizava, in Mexico. The second is common to Carguarazo and Pichinca, in the province of Quito, and to the volcano of Puracey, near Popayan, and perhaps also to Hecla, in Iceland. The third and last form is seen in the majestic figure of Chimborazo, and in the great Sarcony, in Auvergne. In

In order to form a more exact idea of the external ſtructure of volcanoes, it is important to compare their perpendicular height with their circumference; but this can only be done with iſolated mountains placed on a plain which is nearly on a level with the ſea. The height of the Peak of Teneriffe is one twenty-eighth of the circumference of its baſe; that of Veſuvius, according to Von Buch, is a thirty-third; and of Etna, a thirty-fourth. Iſolated volcanoes, in the moſt diſtant regions, are very analogous in their external ſtructure. All have elevated plains, in the middle of which riſes a cone perfectly circular. The greater the quantity of matter that has iſſued from the crater of a volcano, the more elevated is its cone of aſhes, in proportion to the perpendicular height of the mountain. Nothing is more ſtriking than the difference in this reſpect, ſays Humboldt, between Veſuvius, the Peak of Teneriffe, and Pichinca. The cone of Cotopaxi, the form of which is the moſt regular and elegant of any hitherto known, is 540 toiſes in height, but it is impoſſible to decide whether the whole of this maſs is covered with aſhes.

		Cone covered with Aſhes.	
	Toiſes.	Toiſes.	
Veſuvius, height of	606	200	$\frac{1}{3}$
Peak of Teneriffe	1904	84	$\frac{1}{22}$
Pichinca -	2490	240	$\frac{1}{10}$

The latter column ſhews the proportion of the cone to the total height of the mountain.

In moſt volcanic mountains, the cone, or ſugar-loaf, as it has been not unaptly called, preſerves its conic figure to the very ſummit; the whole of the declivity is inclined the ſame number of degrees, and is uniformly covered with layers of volcanic ſand or powder. When we reach the top, nothing obſtructs the view of the bottom of the crater. The Peak of Teneriffe and Cotopaxi, on the contrary, have a different conſtruction. Their ſummits have a circular wall, ſurrounding the brink of the crater, which appears at a diſtance like a ſmall cylinder placed on a truncated cone. According to Humboldt, this peculiar conſtruction of Cotopaxi, is viſible to the naked eye at the diſtance of nearly three leagues. No perſon has reached the crater of this volcano. On the Peak of Teneriffe, the wall that ſurrounds the crater is ſo high, that it would be impoſſible to enter, if there were not a breach which ſeems to have been made by the flowing of an ancient current of lava.

The ſhape of volcanic craters is generally that of a funnel, either circular or elliptical, the ſides ſhelving down to the bottom, which is a plain of greater or leſs extent, having apertures or fiſſures, through which ſmoke and heated vapour are exhaled. At the bottom of many volcanic craters are one or more ſmall cones, which during eruptions enlarge, and ſometimes fill up the crater, and riſe above its brim. The preſent cone of Veſuvius is ſuppoſed to have been raiſed within a crater of much larger ſize, of which mount Somma forms part of the remaining wall. (See Vesuvius.) The ſize of the crater does not depend on the height and maſs of the mountain, of which it forms the principal vent. Veſuvius, which is but a ſmall hill compared with the Peak of Teneriffe, has a crater with a diameter five times larger than that of the latter mountain; and the preſent crater of Vulcano equals or exceeds that of Veſuvius, though the height of the cone is not more than 1500 feet above the level of the ſea. When we reflect, ſays Humboldt, that very lofty volcanoes throw out leſs matter by their ſummits than by lateral openings, we ſhould be led to conclude that the lower volcanoes are, their force and activity being the ſame, the more conſiderable ought to be the ſize of their craters. There are immenſe volcanoes in the Andes, which have but very ſmall openings, and we might eſtabliſh it as a geological principle, that the moſt lofty volcanoes have craters of ſmall extent at their ſummits, if the Cordilleras did not offer many inſtances to the contrary. The great volcanoes of Cotopaxi and Rucupichinca have craters, which, according to the admeaſurement of this indefatigable traveller, exceed half and three-quarters of a mile in diameter.

In a volcano like Veſuvius, the activity of which is principally directed towards the ſummit, the depth of the crater varies before and after every eruption; but at the Peak of Teneriffe, the depth of the crater appears to have been ſtationary for a long time. In 1715, it was eſtimated by Mr. Eden at one hundred and fifteen feet; in 1805, by M. Cordier, at one hundred and ten feet; and ſubſequently, by Humboldt, it was conjectured to have rather leſs depth. The inſide of the crater indicates a volcano, which for a long period has emitted no fire at the ſummit. From the lapſe of time, and the action of vapours, the inſide walls have fallen in, and have covered the baſin with great blocks of lava.

For an account of the cone and crater of mount Ætna, ſee Ætna.

Among the various changes that have taken place in this volcano, it is highly probable that the partition between the upper and lower crater may have been frequently removed. Lieut.-general Cockburn, who viſited Etna in 1810, deſcribes only one crater, though he aſcended the higheſt pinnacle. This crater, he eſtimates at nearly two miles in circumference. At that time the bottom of the crater, which he diſtinctly ſaw, was not flat; it contained ſeveral minor mountains and their craters, ſome ſmoking like the moſt violent glaſs-furnace, or ſteam-engine. Cockburn's Travels in Sicily, vol. i. p. 137.

The whole cone of a volcano is ſometimes ſwallowed up during an eruption, leaving a circular crater of a larger diameter and at a much lower level; which, when the volcanic fire becomes extinct, or remains dormant for ages, may form a lake. The celebrated lake of Avernus, near Naples, and the neighbouring lake Agano, are the craters of extinct volcanoes, the cones of which have probably been buried after a great eruption, or by an earthquake. Numerous circular lakes exiſt in volcanic countries which have had the ſame origin. Nor need we be ſurpriſed at the diſappearance of a volcanic cone, however large, as it muſt ſtand and have its foundation on the brink of a much larger abyſs, from which it has been thrown out, as we ſhall have occaſion to remark in deſcribing the formation of ſome of theſe cones, which have taken place in modern times.

The crater of a volcano can only be approached when the fire is in a dormant or nearly quieſcent ſtate; but as the intervals between volcanic eruptions ſometimes laſt for many years, and even centuries, opportunities are offered for exploring their ſtructure. The floor of the crater appears in many inſtances to be only a thin congealed cruſt, and returns a hollow ſound when ſtruck upon with a ſtone or any hard ſubſtance. This is the caſe at the Solfaterra, which appears to be the floor of an extinct crater. See Solfaterra.

When M. de Luc walked over the bottom of the crater of Vulcano in 1757, it returned a hollow ſound. The largeſt diameter of the crater was then above three-quarters of a mile, and the depth nearly a thouſand feet. In 1781 it was viſited by M. Dolomieu, who found it impoſſible to enter the crater; its depth he eſtimated at half a mile from the brink, and the bottom not more than two hundred and fifty feet in diameter. He threw in ſome large ſtones from the

the edge of the crater, which he perceived sunk in some fluid when they reached the bottom. This fluid could not be aqueous, since it would soon have been evaporated by excessive heat; he supposed it to be melted sulphur, as he saw that substance trickle down the sides, against which it had sublimed. With a good telescope he could discover at the bottom two small pools, which he supposed to be full of the same combustible matter. He likewise observed, that the fumes which in the day-time appeared white, were by night splendent, but placid flames, that rose above the mountain, and diffused their light to some distance.

Spallanzani, who visited Vulcano seven years after Dolomieu, found the bottom only about a quarter of a mile deep, but intolerably hot.

The changes which took place in this interval, were probably occasioned by a violent commotion which occurred in the month of March 1786, during which the crater threw out a prodigious quantity of volcanic powder or sand with immense volumes of smoke and flame. This eruption lasted fifteen days.

That the bottom of the crater should vary considerably in depth after every eruption will not appear surprising, if we reflect that this bottom is a crust of congealed lava, more or less covered with loose materials, which have fallen upon it. When the lava which has been forced up near to the brink of the crater, remains stationary at the close of an eruption, and solidifies, the melted lava will gradually sink down as the intensity of the volcanic fire diminishes at the surface, thus leaving a crust of greater or less thickness over a hollow space below. The depth of this floor from the brink will depend on the quantity of lava which remains in the crater towards the end of an eruption.

The phenomena preceding and attending volcanic eruptions, vary according to the situation in which they break forth, and the magnitude or intensity of the volcanic fire. An eruption may proceed from ancient volcanoes, which have been dormant for a longer or shorter period, or it may break out from a new opening or from under the sea. The phenomena most common to each of these situations we shall briefly describe. The indications of an approaching eruption from a dormant volcano, are the increase of smoke from the summit of the crater, which sometimes rises to a vast height, branching in the form of a pine-tree. This was the case in the memorable eruption of Vesuvius, described by Pliny, in the year 79 of the Christian era. The cause of this appearance is probably the violent escape of elastic gas driving up the volatile materials into the higher regions of the atmosphere, which in their descent float at different heights, according to their specific gravity, the heaviest stratum floating over a larger space. Tremendous explosions, like the firing of artillery, commence after the increase of smoke, accompanied with tremors of the earth, more or less violent, and by eruptions of red-coloured flame and stones from the crater; after which, in most violent eruptions, currents of melted stone, called lava, flow either over the brink of the crater, or break through the sides of the mountain. These currents, when consolidated by cooling, frequently form a stratum thirty or forty miles in length, several miles broad, and several yards thick, equalling in extent any continuous stratum, among the regular formations of secondary strata. The eruption of lava has been known to continue for several months. Black clouds, composed of dark-coloured sand or powder, improperly called ashes, are thrown out of the crater after the lava ceases to flow. During one eruption of Etna, a space of one hundred and fifty square miles was covered with this sand twelve feet thick. Stones or globiform masses of melted lava are thrown out at the same time, and fall at a greater or less distance, according to their size, and the force with which they are ejected, the larger masses falling nearest to the mouth of the volcano. The smoke and vapour are highly electrical, and vivid violent flashes of lightning dart from it, which frequently occasion much mischief. Towards the conclusion of the eruption, the colour of the volcanic sand changes to white; it consists of pumice in a finely comminuted state. It is observed, that when the lava flows freely, the tremors of the earth and the explosion become less frequent, which proves that they were occasioned by the confinement of the gaseous and solid matter that is afterwards discharged.

Most of the phenomena here mentioned occur in the eruptions of mount Vesuvius, near Naples. The first eruption of this mountain recorded in history, is that which happened in the time of Vespasian, A.D. 79; on which occasion, says Dion Cassius, great quantities of ashes and sulphureous smoke were carried not only to Rome, but also beyond the Mediterranean, into Africa, and even to Egypt. Birds were suffocated in the air, and fell down dead upon the ground, and fishes perished in the neighbouring waters, which were made hot, and infected by it. Sir William Hamilton reckons, that the eruption in 1767 was the twenty-seventh from that in the time of Titus. Since 1767 the eruptions have been frequent.

Bishop Berkeley has given a particular account of the eruption in 1717; for which, see Phil. Trans. N° 354. p. 708, or the Life of Berkeley, in the Biographia Britannica, by Dr. Kippis.

We have an account of mount Vesuvius, and of the eruption from it in 1737, by the prince of Cassano, in the Philosophical Transactions, N° 435. sect. 1, 2.

The matter thrown out flowed like melted lead, and moved about half a mile in an hour, which was then considered as an unusual velocity. The trees touched by this matter, immediately took fire, and fell. Glass in houses was melted into a paste.

Sir William Hamilton has given an accurate and circumstantial description of the eruptions in 1766, 1767, and 1779. See Phil. Trans. vol. lvii. p. 192, vol. lviii. p. 1, &c. vol. lix. p. 18, &c. vol. lxx. part i. p. 42, &c. We shall select his account of the latter. During the whole month of July the mountain continued in a state of fermentation. Subterraneous explosions and rumbling noises were heard, quantities of smoke were thrown up with great violence, sometimes with red-hot stones, scoriæ, and ashes; and towards the end of the month these symptoms increased to such a degree, as to exhibit in the night-time the most beautiful fire-works that can be imagined.

On Thursday, the 5th of August, the volcano appeared most violently agitated; a white and sulphureous smoke issued continually and impetuously from its crater, one puff seeming to impel another, so that a mass of them was soon accumulated, to appearance four times the height and size of the volcano itself. These clouds of smoke were exceedingly white, so that the whole resembled an immense accumulation of bales of the whitest cotton. In the midst of this very white smoke, vast quantities of stones, scoriæ, and ashes were thrown up to the height of two thousand feet, and a quantity of liquid lava, seemingly very heavy, was lifted up just high enough to clear the rim of the crater, and take its way down the sides of the mountain. This lava having run violently for some hours, suddenly ceased, just before it had reached the cultivated parts of the mountain, near four miles from the spot whence it issued. The heat all this day was intolerable at the towns of Somma and Ottaiano,

Ottaiano, and was fenfibly felt at Palma and Lauri, which are much farther off. Reddifh afhes fell fo thick on the two former towns, that the air was darkened, fo that objects could not be diftinguifhed at the diftance of ten feet. Long filaments of a vitrified matter, like fpun glafs, were mixed and fell with thefe afhes; feveral birds in cages were fuffocated, and the leaves of the trees in the neighbourhood of Somma were covered with a white and very corrofive falt.

About twelve at night on the 7th, the fermentation of the mountain feemed greatly to increafe. Our author was watching the motion of the volcano from the mole at Naples, which has a full view of it. Several glorious picturefque effects had been obferved from the reflection of the deep red fire within the crater of Vefuvius, and which mounted high amongft thofe huge clouds on the top of it; when a fummer ftorm (called in that country a tropea), came on fuddenly, and blended its heavy watery clouds with the fulphureous and mineral ones, which were already like fo many other mountains, piled up on the top of the volcano. At this moment a fountain of fire was fhot up to an incredible height, cafting fo bright a light, that the fmalleft objects were clearly diftinguifhable, at any place within fix miles or more from Vefuvius. The black ftormy clouds paffing fwiftly over, and at times covering the whole or a part of the bright column of fire, at other times clearing away and giving a full view of it, with the various tints produced by its reverberated light on the white clouds above it, in contraft with the pale flafhes of forked lightning that attended the tropea, formed fuch a fcene as no power of art can exprefs. One of his Sicilian majefty's game-keepers, who was out in the fields near Ottaiano whilft the ftorm was at its height, was furprifed to find the drops of rain fcald his face and hands, a phenomenon probably occafioned by the clouds having acquired a great degree of heat in paffing through the above-mentioned column of fire.

On the 8th, the mountain was quiet till towards fix o'clock in the evening, when a great fmoke began to gather over its crater; and about an hour afterwards, a fubterraneous noife was heard in the neighbourhood of the volcano; the ufual throws of red-hot ftones and fcoriæ began and increafed every inftant. The crater, viewed through a telefcope, feemed much enlarged by the violence of laft night's explofions, and the little mountain on the top was entirely gone. About nine o'clock a moft violent report was heard at Portici and its neighbourhood, which fhook the houfes to fuch a degree, as made the inhabitants run out into the ftreets. Many windows were broken and walls cracked by the concuffion of the air on this occafion, though the noife was but faintly heard at Naples. In an inftant, a fountain of liquid tranfparent fire began to rife, and gradually increafing, arrived at laft at the amazing height of ten thoufand feet and upwards. Puffs of fmoke, as black as can poffibly be imagined, fucceeded one another haftily, and accompanied the red-hot tranfparent and liquid lava, interrupting its fplendid brightnefs here and there, by patches of the darkeft hue. Within thefe puffs of fmoke, at the very moment of emiffion, a bright but pale electrical fire was obferved playing brifkly about in zig-zag lines. The wind was fouth-weft, and though gentle, was fufficient to carry thefe puffs of fmoke out of the column of fire, and a collection of them by degrees formed a black and extenfive curtain behind it. In other parts of the fky it was perfectly clear, and the ftars bright. The fiery fountain, of fuch immenfe magnitude, on the dark ground juft mentioned, made the fineft contraft imaginable; and the blaze of it reflected from the furface of the fea, which was at that time perfectly fmooth, added greatly to this fublime view.

The lava, mixed with ftones and fcoriæ, having rifen to the amazing height already mentioned, was partly directed by the wind towards Ottaiano, and partly falling, ftill red-hot and liquid, upon the top of Vefuvius, covered its whole cone, part of the fummit of Somma, and the valley between them. The falling matter, being nearly as much inflamed and vivid as that which was continually iffuing frefh from the crater, formed with it one complete body of fire, which could not be lefs than two miles and a half in breadth, and at the extraordinary height above ftated, caft a heat to the diftance of at leaft fix miles round. The brufh-wood on the mountain of Somma was foon in a blaze, and the flame being of a different colour from the deep red thrown out by the volcano, and from the filvery blue of the electrical fire, ftill added to the contraft of this moft extraordinary fcene.

The black cloud, increafing greatly, once bent towards Naples, and threatened the city with fpeedy deftruction; for it was charged with electrical fire, which kept conftantly darting about in bright zigzag lines, like thofe defcribed by Pliny the younger, in his letter to Tacitus, and which accompanied the great eruption of Vefuvius that proved fatal to his uncle. This fire, however, rarely quitted the cloud, but ufually returned to the great column of fire whence it proceeded; though once or twice it was feen to fall on the top of Somma. Fortunately the wind carried back the cloud, juft as it reached the city, and had begun to occafion great alarm. The column of fire, however, ftill continued, and diffufed fuch a ftrong light, that the moft minute objects could be difcerned at the diftance of ten miles or more from the mountain.

Mr. Morris informed our author, that at Sorrento, which is twelve miles diftant from Vefuvius, he read the title-page of a book by that volcanic light.

Whilft the eruption lafted, a mixed fmell, like that of fulphur, with the vapours of an iron-foundery, was fenfible. The air, after one day's eruption, was filled at night for many hours with meteors, fuch as are vulgarly called falling ftars, which fhot generally in a horizontal direction, leaving behind them a luminous trace, which quickly difappeared. Many fmall volcanic ftones and cinders were afterwards found to have fallen more than thirty miles from Vefuvius, and minute afhes fell in great abundance at the diftance of a hundred miles.

During the eruption, the miferable inhabitants of Ottaiano were involved in the utmoft diftrefs and danger, by the fhowers of ftones which fell upon them, and which, had the eruption continued for a longer time, would moft certainly have reduced their town to the fame fituation with Herculaneum and Pompeii. The mountain of Somma, at the foot of which the town of Ottaiano is fituated, hides Vefuvius from the view of its inhabitants; fo that till the eruption became confiderable, it was not vifible to them. On Sunday night, when the noife increafed, and the fire began to appear above the mountain of Somma, many of the inhabitants flew to the churches, and others were preparing to quit the town, when a fudden and violent report was heard, foon after which they found themfelves involved in a thick cloud of fmoke and afhes: a horrid clafhing noife was heard in the air, and prefently fell a vaft fhower of ftones and large pieces of fcoria, fome of which were of the diameter of feven or eight feet, and muft have weighed more than a hundred pounds before they were broken, as fome of the fragments which fir W. Hamilton found in the ftreets ftill weighed upwards of fixty pounds. When thofe large vitrified maffes either ftruck againft one another in the air, or fell on the ground, they broke in many pieces, and covered a large fpace of ground with vivid fparks of fire, which

which ignited every thing that was combuſtible. Theſe maſſes were formed of liquid lava: their exterior parts were become black and porous, by cooling during their fall through ſuch a vaſt ſpace, whilſt the interior retained an extreme heat, and were perfectly red. To add to the horror of the ſcene, inceſſant volcanic lightning darted from the black clouds that ſurrounded the inhabitants, and the ſulphureous ſmell and heat would ſcarcely allow them to breathe. In this ſituation they remained about twenty-five minutes, when the volcanic ſtorm ceaſed all at once, and Veſuvius remained ſullen and ſilent.

Moſt volcanoes are obſerved to have intervals of repoſe of longer or ſhorter duration. Veſuvius has been known to remain inactive for many centuries. (See VESUVIUS.) The periods of intermiſſion of Etna and the Peak of Teneriffe have extended to near a century. According to Humboldt, the long intervals of repoſe appear to characteriſe volcanoes highly elevated; and he adduces ſeveral inſtances in favour of this opinion; but other inſtances might be ſtated which oppoſe it: thus, the periods of repoſe of Veſuvius have been much longer than thoſe of Etna; and Vulcano, which is far lower than Veſuvius, had no eruption from the fourth to the fifteenth century, or during a period of eleven hundred years.

The volcano of Stromboli is the only one at preſent known, which appears to be in a ſtate of conſtant activity. The moſt ancient accounts of the conflagrations of Stromboli, tranſmitted by hiſtory, are prior to the Chriſtian era about two hundred and ninety-two years; but at what time the eruptions firſt commenced we are entirely ignorant. Stromboli was burning in the time of Auguſtus and Tiberius; but for want of documents, we are unacquainted with the ſtate of this volcano for a ſeries of years afterwards. We know, however, from various public teſtimonies, that the continued eruptions have laſted ſome centuries. The crater is ſituated on the ſide of the mountain. Spallanzani, who looked into it from an eminence immediately above it, ſays that it has a circular conical form, and is about three hundred and forty feet in circumference at the brink. To a certain height the crater is filled with liquid red-hot matter, reſembling melted braſs: this is the fluid lava. It appeared to be agitated by two diſtinct motions: the one inteſtine, whirling, and tumultuous; by the other motion it was impelled upwards. The liquid matter is raiſed ſometimes with more and ſometimes with leſs rapidity within the crater; and when it has reached the diſtance of twenty-five feet from the upper edge, a ſound is heard not unlike a very ſhort clap of thunder; while, at the ſame inſtant, a portion of the lava, ſeparated into a thouſand pieces, is thrown up with indeſcribable ſwiftneſs, accompanied with copious eruptions of ſmoke and ſand.

A few moments before the report, the ſurface of the lava is inflated and covered with large bubbles, ſome of which are ſeveral feet in diameter. On the burſting of theſe bubbles, the detonation and fiery ſhower take place. After the exploſion, the lava ſinks within the crater, but ſoon riſes as before, and new bubbles appear, which again burſt, and produce new exploſions. When the lava ſinks, it produces little or no ſound; but when it riſes, and begins to be inflated with bubbles, it is accompanied with a ſound like that of liquor boiling vehemently in a cauldron, but greater in proportion to the magnitude of the crater. In the ſmaller and moderate ejections, the ſtones fell into the crater, and, at their colliſion with the lava, produced a ſound ſimilar to that of water ſtruck by a number of ſtaves; but in the greater ejections, a conſiderable quantity of them fell without the mouth of the crater. The redneſs of the larger ſtones was viſible in the air, notwithſtanding the light of the ſun. The lava, when it roſe or fell, emitted but little ſmoke; but a great quantity iſſued from the fiſſures, when it exploded. This diſappeared almoſt inſtantly after the exploſion, like the ſmoke from the firing of gunpowder. Though the ejection of the larger and heavier ſtones have ſhort intermiſſions, thoſe of the leſſer have ſcarcely any. Did not the eye perceive from whence theſe ſhowers of ſtone originate, they might be ſuppoſed to fall from the ſky. The noiſe of the more violent eruptions, and the darkneſs from the aſcending ſmoke, preſent together the image of a tempeſt. During the night, the red-hot ſtones ſpread like a ſheaf, and have the appearance of a beautiful fire-work.

It has been obſerved of Stromboli, that the inflammation is in general more conſiderable in winter than in ſummer, and more intenſe on the approach of, or during, ſtorms than in calm weather. The materials which ſupply the eruptions appear to be inexhauſtible; and there is reaſon to believe that the volcanic fires of Stromboli and Vulcano have an internal communication with thoſe of Ætna and more diſtant countries, as we ſhall preſently have occaſion to notice.

Boiling water and mud are occaſionally thrown out of volcanoes, but more frequently from the American volcanoes than from thoſe in Europe. This phenomenon is very different from that of mud volcanoes, more properly ſo called, the water ejected from which is cold.

The water ejected from fire volcanoes is probably what finds acceſs to the deep maſs of melted lava, either from the ſea in the vicinity, or from the neighbouring lakes. Veſuvius is ſtated at one time to have thrown out a conſiderable quantity of ſalt water.

The moſt remarkable circumſtance attending the volcanic eruptions in America is that ſtated by Humboldt, who informs us that great quantities of fiſh are ſometimes ejected from the crater at the top, and ſometimes from the ſides of the mountain, through lateral openings; but always from an elevation more than fifteen thouſand feet above the level of the ſea. M. Humboldt has given the name of *pimelodus cyclopum* to this ſpecies of fiſh. Some of them are found living in the rivers on the ſides of the mountains, and in all probability they exiſt in ſubterranean lakes, the ſides of which are broken down during violent commotions, or melted by heat: hence the water finds its way to the crater, and is ejected with other materials. From this acceſs of water, the mud or ſlime thrown out, called by the Indians *moya*, is probably formed.

In many inſtances, however, the torrents of water which iſſue from volcanoes ariſe from the rapid thawing of the ſnow on the ſummit. According to Humboldt, the coloſſal volcanic cones in the Andes, covered with ſnow, have become ſo hot in a ſingle night as to melt the whole of the ſnow, and occaſion the moſt extenſive and fatal inundations. Torrents of water iſſued from Etna, in the eruption of 1755; but, according to Ferrara, they did not flow out of the crater, but from the ſnow and ice on the ſurface ſuddenly thawed by the lava. A maſs of this ice, partially melted by the lava, left a pile in the midſt ſtanding like a ſuperb palace of cryſtal.

It is only by obſervations made in or near the crater, when a volcano is in a quieſcent ſtate, that we can gain any knowledge of the ſaline or inflammable matter, which may either have ſerved as fuel to the volcano, or have been produced by the eruption, or been ſubſequently ſublimed. Of theſe we ſhall ſpeak more particularly, in deſcribing *Volcanic Products*, infra. The rapidity and extent of a current of

 lava

lava will depend on its fluidity, the quantity thrown out, and on the more or less rapid declivity of the mountain.

From various experiments made by Spallanzani and others, on the melting of lavas, it appears that they are susceptible of different degrees of fluidity, according to the degrees of temperature to which they are subjected. These gradations of fluidity, proportioned to the degree of heat, take place in other stones or substances fusible by fire, as may be observed in the slag from our furnaces. In some instances, the lava appears to have the perfect fluidity of water. According to professor Bottis, who was an eye-witness in 1776, the lava spouted from three small cones or apertures on Vesuvius, precisely like water, forming three beautiful fountains of fire, which described curves of different dimensions as they fell. He says also, that he has twice seen the inflamed matter break forth and disgorge in the Atrio del Cavallo, at the foot of the volcanic cone of Vesuvius. From its great fluidity, it resembled water issuing with violence from under the earth, and inundating the adjacent country. The current of lava, which flowed from this mountain in 1776, struck upon the lava of 1771, and rebounded into the air, congealing in various figures, terminating in thin sharp points like needles. In the eruption of 1754, the lava formed two branches, which flowed thirty feet in forty-five seconds, or above half a mile an hour; and uniting lower down, proceeded at the rate of thirty-three feet in fifty seconds. In 1765, the lava is stated to have flowed at the rate of a mile an hour. Another branch of the same lava is said by sir William Hamilton to have had a velocity equal to that of the river Severn at Bristol. In 1776, a torrent of lava from the summit of Vesuvius was observed to flow a mile and a half in fourteen minutes. When the declivity is very gentle, the motion is slow, if the current is not pressed forward by new supplies of melted matter. Notwithstanding the velocity of torrents of lava, their tenacity is much greater than might at first have been expected. Sir William Hamilton informs us, that the lava of Vesuvius in 1765, which flowed a mile an hour, almost resisted any impression made on it with a long pole; and some large stones, thrown upon it with great force, did not sink, but making only a slight impression, swam upon its surface. The tenacity and resistance of lavas, even when flowing, is, says Spallanzani, an evident consequence of the action of the cold atmosphere. The loss of heat so occasioned is incomparably greater on the surface than in the internal parts, in which the lava still retains a considerable degree of fluidity, as appears on breaking the crust. The different currents of lava from Etna have flowed to the distance of fifteen, twenty, and even thirty miles from their source; and the current of lava, which flowed during the volcanic eruption of 1783 in Iceland, extended nearly sixty miles in length.

New Volcanoes.—When a volcano breaks out in a new situation, the phenomena are generally somewhat different; but it may be proper to remark, that we have no instances of volcanoes breaking out on land, in countries that are not or have not formerly been volcanic. New openings have indeed been made, at the distance of several miles from any existing volcano; but they have taken place in a volcanic or basaltic soil. From present appearances we are warranted in the conclusion, that all volcanoes were originally submarine. The most remarkable instance of the formation of a range of volcanic mountains in a new situation is that recorded by Humboldt of the volcano of Jorullo, and the adjoining hills, in the intendancy of Valladolid, or Mechoacan, in New Spain, on the 29th of September, 1759.

A vast plain extends from the hills of Aguasarco nearly to the villages of Teipa and Petatlan. This plain is in some parts not more than two thousand six hundred feet above the level of the sea: it contains various conical hills of basalt and porphyry, crowned with evergreen oaks and palm-trees. Till the middle of the eighteenth century, part of the plain was cultivated with sugar-canes and indigo. It was bounded by basaltic mountains, the structure of which indicated that, at a very remote period, this country had several times been convulsed by volcanoes. These fields, watered by artificial means, belonged to the plantation of San Pedro de Jorullo, one of the largest and richest in the country. In the month of June, 1759, hollow subterranean noises of a most alarming kind were accompanied by earthquakes, which succeeded each other for sixty days, to the great consternation of the inhabitants. After the commencement of September, tranquillity appeared re-established; but on the nights of the 29th and 30th, the horrible subterranean noises were renewed. The affrighted inhabitants fled to the mountains of Aguasarco.

A tract of ground, ten English miles in extent, rose up in the shape of a bladder above the old level of the plain. Near the edges it is only thirty-nine feet above the plain; but towards the centre, the convexity of the ground rises to the height of five hundred and thirty-four feet above its former level. This part of the ground is called *Malpays*. Those who witnessed the scene from the top of Aguasarco assert that flames were seen to issue forth from an extent of more than half a league, that fragments of burning rocks were thrown to a prodigious height, and that the softened surface of the earth seemed to swell like an agitated sea. The rivers Cuitambo and San Pedro precipitated themselves into the burning abyss, and appeared to invigorate the flames. Torrents of mud and clay, enveloping balls of basalt in concentric layers, were thrown out. Thousands of small cones rose up in the Malpays, from each of which a thick vapour ascended. In the midst of these cones was opened a large chasm, from which were thrown out six large masses or mountains, from thirteen to sixteen hundred feet in height above the level of the plain: the most elevated of these is the volcano of Jorullo. Here we have a range of volcanic hills formed in a few days, in the same manner as the Monte Nuovo near Naples, but of an extent and elevation exceeding that of the Malvern hills in Worcestershire, or the Pentland hills near Edinburgh.

The volcano of Jorullo is still continually burning, and according to M. Humboldt's account, who visited it in 1803, it has thrown up on the north side an immense quantity of scoriæ and basaltic lavas, containing fragments of primitive rocks. The first great eruption continued to the year 1760: in the following years, the explosions became gradually less frequent. The traveller is still shewn where the rivers Cuitambo and San Pedro disappeared on the night of September 29, 1759. About one mile and a half lower down now rise up two rivers, impregnated with mineral matter, having a temperature of 126° Fahrenheit.

There is one circumstance attending this great eruption, which seems peculiar to the formation of new volcanoes or volcanic cones. An immense rent is made in the surface, through the whole of which the matter is ejected, until the chasm becomes choaked up in different parts, and the eruptions are confined to a few openings, round which the matter is accumulated, forming a series of craters or mountains, ranged in one line. A similar range of volcanic cones was formed on the side of Etna, nearest Lingua Grossa, in the year 1809. In this eruption, nine new boccas or craters were formed in the same line, near to each other. The ancient volcanoes in Auvergne, which are ranged in a line of sixty

fixty miles, and alfo other volcanic ranges of great extent, have probably been formed by enormous chafms, partially choaked up in the fame manner. Indeed the new volcanic range, of which Jorullo forms a part, is placed in the direct line of a volcanic range of vaft extent, which this eruption appears to have partially re-opened. Humboldt obferves, that in New Spain there is a narrow zone placed between latitude 18° 59′ and 19° 12′, in which the lofty volcanoes that ftill continue to burn, or which from their form and the nature of the rocks may be inferred to have been once volcanic, are fituated. In receding from the Atlantic, we find in the fame line, ranging eaft and weft, the Pic d'Orizaba, the two volcanoes of Le Puebla, the Nevada de Toluca, and the volcano of Colima. The parallel of their greateft elevation ranges nearly at right angles with the chain of mountains that form the Cordillera of Anahuac; and it is worthy of obfervation, that the volcano of Jorullo forms a prolongation of that line, on the fame parallel with the ancient Mexican volcanoes. Do not thefe analogies, he adds, entitle us to fuppofe that in this part of Mexico there exifts, at a great depth in the earth, a chafm, extending in a direction from eaft to weft one hundred and thirty-feven leagues, along which the volcanic fire, at different epochas, has burft through the porphyritic cruft, from the gulf of Mexico to the South fea? This chafm may alfo extend to the group of iflands called the Archipelago of Revellegedo, placed in the fame parallel of latitude, around which pumice-ftone has been feen floating.

For an account of the volcanic eruption which formed Monte Roffo on Etna, fee ÆTNA.

A tremendous noife and violent concuffions of the earth preceded the repeated difcharges of fcoriæ and fand in this eruption; yet during all thefe convulfions, the fummit of Etna was perfectly quiet, and only emitted a light fmoke, which had iffued with the fame tranquillity before the eruption. A range of volcanic hills was formed in a fimilar manner near the foot of Vefuvius, in 1760. After repeated concuffions of the earth, which were felt fifteen miles round the mountain, a vaft opening was made in the territory of Torre del Greco, from which fifteen volcanoes arofe; eight of thefe were foon covered by a torrent of lava, which rufhed from one of them; the other feven remaining entire, and inceffantly ejecting from their mouths vaft quantities of ignited fubftances, which falling almoft perpendicularly round the new volcanoes, produced in ten days feven fmall mountains of various heights, difpofed in a right line. During the eruption, the noifes fometimes refembled violent thunder, at others the difcharge of artillery; large ftones were thrown to the height of nine hundred and fixty feet. After the tenth day, the eruption ceafed, and the newly-formed mountains gradually cooling, permitted a nearer approach; fome of them had at their fummits a cavity refembling a funnel, others a hollow of greater or lefs depth.

The Lipari iflands extend in a right line about fifty miles from eaft to weft, except Vulcano, which makes a fmall angle. Thefe iflands, as well as the volcanic ifles of the Moluccas, which form a chain in the Indian ocean, probably originated from enormous chafms, like thofe which formed Jorullo, and the ranges on the fides of Etna and Vefuvius. Thefe chafms were in all probability firft opened under the ocean.

When a volcano opens in a new fituation, the commotions which precede it will be greater than when the eruption takes place from craters already formed. The refiftance occafioned by the congelation of lava in the mouth and paffages of the principal crater, may be greater than from other parts of the furface, in which cafe the liquid lava, confined and compreffed by the expanfive force of heat and elaftic vapour, may be driven laterally to a great diftance between the feams and fiffures of the ftrata, upheaving the furface in fome parts, and foftening it or melting it in others, producing earthquakes in countries far remote from the principal crater, which will continue till a new opening is made.

It is related by Strabo, that the ifland of Eubœa had been for a long time violently agitated by earthquakes, when a large rent opened in the plain of Lelantum, from which was ejected a river of fiery mud; after this the earthquake ceafed. Other inftances of violent earthquakes, felt at the diftance of many hundred miles from the place of eruption, are not uncommon, as we fhall foon have occafion to notice. The lateral preffure occafioned by a column of lava two miles in height, muft be enormoufly great, and from this caufe alone we might expect, that in very lofty volcanoes, like Etna, the eruptions fhould be more frequent from the fides than the fummit, which is found to be the fact. The fudden retiring of the fea from the fhore before an eruption has frequently been noticed. This can only be fatisfactorily explained by the upheaving of the foftened furface of the ground; and during violent earthquakes, the anchors let down at a diftance from the fhore have been obferved to be heated, proving the ftate of the ground below.

Submarine Volcanoes.—When a volcano breaks out under the furface of the fea, the phenomena attending the eruption vary confiderably from thofe obferved on land, owing to the oppofition of conflicting elements, the refiftance made to the eruption, and the more fudden cooling of the matter ejected. It is the opinion of Humboldt, that in all fubmarine volcanoes, the cruft of the earth is foftened and fwelled by fubterranean heat, till it rifes above the furface of the ocean even from great depths, before any eruption takes place. From the narrative of eye-witneffes, we have reafon to believe that in many inftances the opinion of Humboldt is correct. There are, however, volcanic eruptions which undoubtedly take place at the bottom of the fea, and the appearance of new land is caufed by the ftones and fcoriæ thrown up from thence: the more rapid cooling of the cruft of the lava may alfo accelerate the formation of a new ifland. We have alfo inftances of immenfe quantities of pumice floating in the ocean fome hundred leagues from land, which could only proceed from the eruption of volcanoes at fo great a depth under the fea as to prefent no other volcanic phenomena on its furface. The fubmarine volcanoes which have been obferved fince the records of authentic hiftory are not very numerous, nor will this appear furprifing, when we confider that the ocean has not been extenfively traverfed by civilized men more than a few hundred years. The numerous volcanic iflands fcattered over the globe, which are evidently formed by fubterranean fire, may however convince us, that the phenomena of fubmarine volcanoes have been not unfrequent in a former condition of the globe. The fubmarine volcanoes of which we have the earlieft account, are thofe in the Grecian Archipelago, near the ifland of Santorini. This ifland forms a triangle with the ifland of Melo, which is volcanic, and with Paros, fo celebrated for its marble. The fides of the triangle are about fifteen leagues each.

Santorini, formerly Thera, and afterwards St. Irene, was furnamed by the Greeks Καμενη, or *burnt*, and fo in fact the foil is. There is a tradition, fays Pliny, (lib. ii. cap. 87.) "that it rofe out of the fea in a very remote but unknown period." The fea is very deep near Santorini, there being no

no ground for anchorage near it. The ancients have left us the following account of the eruptions in its vicinity.

In the fourth year of the 135th Olympiad, or 236 B. C., the island of Therasia rose in the midst of fire from the sea; it is separated from Santorini by a strait of a mile and a half in breadth.

A hundred and thirty years afterwards, the island of Automate, called also Hiera, rose near it; and one hundred and ten years after this, another island, called Thia, rose two hundred and fifty paces from Hiera. These three eruptions are recorded by Pliny, in the place above cited; by Strabo, lib. i.; and by Seneca, in the Quæstiones Naturales, lib. vi. cap. 21.

Since the Christian era, we have the following accounts of the submarine eruptions near Santorini.

In the year 726, Thia was joined to Hiera by a quantity of lava ejected, together with ashes and red-hot rocks.

In 1457, the island was still farther increased by a similar eruption. This event and the date are attested by an inscription on a marble stone erected near the gate of fort Scaumo, in Santorini.

A sixth eruption, in 1576, produced a new island, called the Little Kamenoi.

According to the account of Kircher, a cotemporary author, there was an eruption in 1650, which lasted a twelvemonth, from the 24th of September to the 9th of October in the following year. "The sea rose to the height of forty-five feet, and that at such a distance, that some galleys of the grand seignor's were wrecked in the port of Candia, situated more than eighty miles from Santorini, and Smyrna and Constantinople were incommoded with the ashes, which rushed out of the sea in whirlwinds of flame. Another great eruption took place in 1707 and 1708, whereby the Little Kamenoi was increased, and is now more than three leagues in circumference. On the 23d of May, 1707, after an earthquake that happened the night before, a new island was discovered by some seamen, who taking it for a wreck, rowed immediately toward it, but finding rocks and earth, instead of the remains of a ship, hastened back, and spread the news of what they had seen in Santorini. How great soever the apprehensions of the inhabitants were at the first sight, their surprise soon abated; and in a few days, seeing no appearance of fire or smoke, some of them ventured to land on the new island. Their curiosity led them from rock to rock, where they found a kind of white stone, that cut like bread, which it nearly resembled in its form and consistence. They also found many oysters sticking to the rocks; but while they were employed in gathering them, the island moved and shook under their feet, upon which they ran with precipitation to their boats. With these motions and tremblings the island increased not only in height, but in length and breadth; yet sometimes, while it was raised and extended on one side, it sunk and diminished on the other.

"Our author observed a rock rise out of the sea forty or fifty paces from the island, which having continued four days, sunk, and appeared no more; but several others appeared and disappeared alternately, till at last they remained fixed and unmoved. In the mean time, the colour of the surrounding sea was changed: at first it was of a light green, then reddish, and afterwards of a pale yellow, accompanied with a noisome stench, which spread itself over part of Santorini.

"On the 16th of July the smoke first appeared, not indeed from the island, but from a ridge of black stones which suddenly rose about sixty paces from it, where the depth of the sea was unfathomable. Thus there were two separate islands, one called the White and the other the Black island, from their different appearances. This thick smoke was of a whitish colour, like that of a lime-kiln, and was carried by the wind to Santorini, where it penetrated the houses of the inhabitants.

"In the night between the 19th and 20th of July, flames began to issue with the smoke, to the great terror of the inhabitants of Santorini, especially those of the castle of Scaro, who were not above a mile and a half distant from the burning island, which now increased very fast, large rocks daily springing up, which sometimes added to its length, and sometimes to its breadth. The smoke also increased, and there being no wind, it ascended so high as to be seen at Candia and other distant islands. During the night it resembled a column of fire, fifteen or twenty feet high; and the sea was then covered with a scurf or froth, in some places reddish, and in others yellowish, from which proceeded such a stench, that the inhabitants throughout the whole island of Santorini burnt perfumes in their houses, and made fires in the streets to prevent infection. This indeed did not last above a day or two, for a strong gale of wind dispersed the froth, but drove the smoke upon the vineyards of Santorini, by which the grapes in one night were parched up and destroyed. This smoke also caused violent head-aches, attended with retchings.

"On the 31st of July, the sea smoked and bubbled in two different places near the island, where the water formed a perfect circle, and looked like oil when ready to boil. This continued above a month, during which many fish were found dead on the shore of Santorini. The following night a dull hollow noise was heard, like the distant report of several cannon, which was instantly followed by flames of fire, shooting up to a great height in the air, where they suddenly disappeared. The next day the same hollow sound was several times heard, and succeeded by a blackish smoke, which, notwithstanding a fresh gale blew at that time, rose up in the form of a column to a prodigious height, and would probably in the night have appeared as if on fire.

"On the 7th of August the noise was different, it resembled that of large stones thrown all together into a deep well. This noise having lasted some days, was succeeded by another much louder, so nearly resembling thunder, as hardly to be distinguished from three or four real claps that happened at the same time.

"On the 21st, the fire and smoke very considerably diminished, but the next morning they broke out with greater fury than before. The smoke was red and very thick; and the heat was so intense, that all around the island the sea smoked and bubbled in a surprising manner. At night, our author viewing with a telescope a large furnace upon the highest part of the island, discovered sixty smaller openings or funnels, all emitting a very bright flame; and he imagined there might be many more on the other side of the great volcano. On the 23d of August, in the morning, the island was much higher than the day before, and its breadth was increased by a chain of rocks, sprung up in the night almost fifty feet above the water. The sea was also again covered with reddish froth, which always appeared when the island received any considerable additions, and occasioned an intolerable stench, till it was dispersed by the wind and the motion of the waves.

"On the 5th of September the fire opened another vent at the extremity of Black island, from which it issued for several days, during which but little was discharged from the large furnace: and from this new passage the astonished spectators beheld the fire dart up three several times, to a vast height, resembling so many prodigious sky-rockets, of a glowing

glowing lively red. The following night the subterraneous fire made a terrible noise, and immediately after, a thousand sheaves of fire blew up into the air, where breaking and dispersing, they fell like a shower of stars upon the island, which appeared all in a blaze, presenting to the amazed spectators at once a most dreadful and beautiful illumination. To these natural fire-works succeeded a kind of meteor, which for some time hung over the castle of Scaro, which is seated on a high rock in the island of Santorini, a meteor not unlike a fiery sword, and which served to increase the terror of the inhabitants.

"On the 9th of September, the White and Black islands united, after which the western end of the island daily increased. There were now only four openings that emitted flames, which issued forth with great impetuosity, sometimes attended with noise like that of a large organ-pipe, and sometimes like the howling of wild beasts. On the 12th, the subterraneous noise became much augmented, having never been so frequent or so dreadful as on that and the following day. The bursts of this subterranean thunder, like a general discharge of the artillery of an army, were repeated ten or twelve times within twenty-four hours; and immediately after each clap, the large furnace threw up huge red-hot stones, which fell into the sea at a great distance. These claps were always followed by a thick smoke, which spread clouds of ashes over the sea and the neighbouring islands.

"On the 18th of September an earthquake was felt at Santorini, but did no great damage, though it considerably enlarged the burning island, and in several places gave vent to the fire and smoke. The claps were also more terrible than ever, and in the midst of a thick smoke, that appeared like a mountain, large pieces of rock were thrown up with as much noise and force as balls from the mouth of a cannon, which afterwards fell upon the island, or into the sea. One of the small neighbouring islands was several times covered with these fiery stones, which being thinly crusted over with sulphur, gave a bright light, and continued burning till that was consumed.

"On the 21st, after a dreadful clap of subterraneous thunder, very great lightnings ensued, and at the same instant the new island was so violently shaken, that part of the great furnace came tumbling down, and huge burning rocks were thrown to the distance of two miles and upwards. This seemed to be the last effort of the volcano, and to have exhausted the combustible matter, as all was quiet for several days after. But on the 25th the fire broke out again, with still greater fury, and among the claps was one so terrible, that the churches of Santorini were soon filled with crowds of people, expecting every moment would be their last; and the castle and town of Scaro suffered such a shock, that the doors and windows of the houses flew open. The volcano continued to rage during the remainder of the year; and in the month of January 1708, the large furnace without intermission threw out stones and flames at least once or twice, but generally five or six times a day.

"On the 10th of February, in the morning, a pretty strong earthquake was felt at Santorini, which the inhabitants considered as a prelude to greater commotions in the burning island: nor were they deceived; for soon after, the fire and smoke issued in prodigious quantities; the claps like thunder were redoubled; and nothing appeared but objects of horror and confusion. Rocks of an amazing size were raised up to a great height above the water, and the sea raged and boiled to such a degree, that it occasioned great consternation. The subterraneous bellowings were heard without intermission, and sometimes, in less than a quarter of an hour, there were six or seven eruptions from the large furnace. The noise of the repeated claps, the quantity of huge stones that flew on every side, the houses tottering to their very foundations, and the fire which now appeared in open day, surpassed all that had hitherto happened, and formed a scene astonishing beyond description.

"The 15th of April was rendered remarkable by the number and violence of the bellowings and eruptions, by one of which near a hundred large stones were thrown up all together into the air, and fell again into the sea, at about two miles distance. From this time to the 23d of May, which might be called the anniversary of the birth of the new island, things continued much in the same state; but afterwards the fire and smoke by degrees subsided, and the subterraneous thunders became less terrible.

"On the 15th of July, 1709, our author, accompanied by the Romish bishop of Santorini and some other ecclesiastics, hired a boat to take a near view of the island. They made directly towards it, on that side where the sea did not bubble, but where it smoked very much. Being got into this vapour, they felt a close suffocating heat, and found the water very hot and sultry. Having encompassed the island, and surveyed it carefully from an adjacent one, they judged it to be two hundred feet above the sea, about a mile broad, and five miles in circumference; but not being thoroughly satisfied, they resolved to attempt to land, and accordingly rowed toward that part of the island where they perceived neither fire nor smoke; but when they got within a hundred yards of it, the great furnace discharged itself with its usual fury, and the wind blew upon them a thick smoke, and a shower of ashes, which obliged them to quit their design. Having retired a little, they let down a plummet, with a line ninety-five fathoms long, but it was too short to reach the bottom. On their return to Santorini, they observed that the heat of the water had melted most of the pitch from their boat, which was before grown very leaky. For several years afterwards the island continued to increase, and the fire and subterranean noises abated."

Another eruption, almost equally violent, took place in 1767, in the month of June, and a new island was formed between the Little Kamenoi and the island of Hiera. It is named the Black island, and is twice as large as the Little Kamenoi. There have been nine of these submarine eruptions recorded in the space of twenty-one centuries, and probably many others have occurred at great depths, without raising new islands. Thevenot, a respectable traveller, who visited Santorini in 1655, states that eighteen years before his arrival in the island, a violent noise was heard there, and even at Chios, though distant two hundred miles, and was at first supposed to be occasioned by an action between the Venetian and Turkish fleets. A short time after, a vast quantity of pumice-stone rose from the bottom of the sea, near the harbour, with such violence and noise, as to resemble repeated discharges of artillery, which so infected the air, that several persons died at Santorini, and others lost their sight. The infection extended to Chios and Smyrna. The pumices thrown up covered the sea in such a manner, that when certain winds prevailed, the harbours were so blocked up with them, that not even the smallest vessels could get out, till a way was made for them, by removing the pumices with long poles; and they were still, in 1655, seen scattered over the whole Mediterranean. Voyages de M. Thevenot, prem. part.

Various submarine volcanoes have broken out near the islands called Azores or Terceras, and have raised several new islands. The phenomena attending their formation were similar to those which took place at Santorini. These eruptions have occurred since the Azores were first visited by Europeans.

Europeans. The Azores, indeed, appear to have been all formed in a fimilar manner at a remote period. Moft of the newly formed iflands have funk down fome months after their emerfion. So recently as 1811, a fmall ifland was raifed by a fubmarine eruption, at a little diftance from St. Michael's. It was a mafs of black rock, defcribed by the captain of the Sabrina frigate, who witneffed its formation, to be equal in height to Matlock High Tor, in Derbyfhire. In 1813 it had difappeared, and there is now eighty fathoms water in the place.

In 1783, about the end of January, flames broke out from the fea, at the diftance of thirty miles from Cape Reckianes, at the fouth-weft extremity of Iceland, and continued to burft forth during feveral months. In June earthquakes fhook the whole of Iceland, and the flames from the fea difappeared. A dreadful eruption then commenced from the Shaptaa Jokul, nearly two hundred miles diftant from the place where the fubmarine volcano broke out. This eruption is one of the greateft recorded in hiftory. The inhabitants of Iceland never faw the fun during the remaining part of the fummer, and black volcanic fand fell in the Orkney iflands, and was called black fnow. The whole of Europe was covered with a haze, which greatly obfcured the atmofphere when no clouds were prefent. It was in the fummer of the fame year that the dreadful earthquakes in Sicily took place, which nearly deftroyed the harbour of Meffina, and did incalculable damage in various parts of Calabria. According to the account of fir George Mackenzie, the volcano of Heckla is nearly in a direct line between the fubmarine volcano and the Shaptaa Jokul, which indicates that a communication fubfifted between them: hence, fays he, we may conjecture, "that the depth of the fource from whence they both proceeded was very great." Were we to admit that the fource of the motion which produced the earthquakes in Calabria was the fame with that of the volcanic fires in Iceland, we muft place it fome thoufand miles below the furface, if not in the centre of the globe itfelf.

Mud Volcanoes.—Befides the volcanoes already defcribed, there are others refembling them in many circumftances, but differing in this important one, that inftead of fire, they throw out water and mud. They are much lefs common than fire volcanoes. There is one in the ifland of Sicily; there are others in the Crimea and its vicinity; and one alfo in the ifland of Java.

Maccaluba, in Sicily, is fituated between Arragona and Girgenti, formerly Agrigentum. In its vicinity is a conical hill truncated, and forming a plain at the fummit of half a mile in circumference.

The whole furface of this plain is a thick mud, yet not fo firm, but that it fometimes occafions a fear of finking into it. There is not the flighteft fign of vegetation upon it. The depth of the mud is unknown, but it is fuppofed to be immenfe.

In the courfe of the year this plain prefents two different appearances. In the rainy feafon the mud is much foftened; it has an even furface, on which there is nothing more to be feen than a general ebullition, accompanied with a very fenfible rumbling noife. At this time it is dangerous to go upon the fpot. In the dry feafon the fcene changes, the mud acquires greater confiftency, but without ceafing its motion; the plain affumes a form flightly convex, and a number of little cones are thrown up, which, however, rarely rife to the height of two feet. Each of them has its crater, where a black mud is feen in conftant agitation, and inceffantly emitting bubbles of air. With thefe the matter infenfibly rifes. As foon as the crater is full of it, it difgorges: the refidue finks, and the cone has a free crater until a new emiffion. In this feafon alfo, to the weft of this fmall plain, there appear fome cavities full of muddy faltwater, from which likewife bubbles of air are thrown up; but here it is without noife; whereas in the cones, the air makes a crackling, as when it proceeds from water that boils violently.

Such are the regular ftates of this extraordinary hill in the courfe of the year. It would probably have obtained but little attention, had thefe been the only phenomena it prefents.

But at times the hill affumes quite another character, being fubject to convulfions alarming to all its environs. They are denoted by earthquakes, which are felt at the diftance of two or three miles. Internal noifes, refembling the rolling of fubterranean thunder, are heard; they increafe for feveral days, and then end in an eruption of a prodigious fountain of mud, earth, and ftones, which rifes two or three hundred feet into the air. This explofion is fometimes repeated twice or thrice in the courfe of the twenty-four hours. Some years the mount has no eruptions. Of the eruption in 1777, Ferrara gives the following account. "Dreadful noifes were heard all around, and from the midft of the plain an immenfe column of mud arofe to the height of about one hundred feet, which, on defcending, affumed the appearance of a tree at the top. Stones of all kinds and fizes were darted up violently and vertically within the body of the column. This terrible explofion lafted half an hour, when it became quiet; but after a few minutes refumed its courfe, and with thefe intermiffions, continued all the day. During the time of this phenomenon, a pungent fmell of fulphuretted hydrogen gas was perceived at a great diftance. On the following day the new orifices had ejected feveral ftreams of calcareous earth (called by Ferrara chalk); this had covered with a cruft of many feet all the furrounding fpace, filling the cavities and chinks. The hard fubftances ejected were fragments of calcareous tufa, of cryftallized gypfum, pieces of quartz and of iron pyrites, which had loft their luftre, and were broken to pieces.

The apparent boiling of the mud proceeds from the efcape of bubbles of gas, for the mud does not feel warm, and the thermometer, on being immerfed in it, fell three degrees. Of the other mud volcano, we have the following account by Pallas, Tableau Phyfique de la Taurida, 1794.

The ifland of Taman is fituated near the peninfula of Kenha, and is feparated from it by one of the mouths of the river Cuban, on the fouth-eaft of Little Tartary, now Taurida. The country is flat, and covered with beds of flime, mixed with mud, and with fome beds of marle and fea-fhells. Copious fprings of petroleum are found in feveral places, alfo pools of greater or fmaller dimenfions, from moft of which a briny mud is difgorged with bubbles. There are three of thefe pools in the peninfula, and feven or eight in Taman. One of the latter, feveral fathoms in diameter, fituated on the fide of a hill, fhews by its inceffant bubbling the abundance of gas that keeps it working; the liquid river is conftantly falling over the brim of it, and flowing off flowly. On the top of the fame hill are feen three fmall eminences, which are evidently formed by the mud vomited by three fimilar pools, formerly open. At the foot are two little lakes of falt-water, which fmell of petroleum. Perfons fettled at Yenikoul for fifteen or twenty years paft, remember an explofion on this hill, accompanied with circumftances fimilar to what took place in a different part of the ifland, fix months previous to the author's journey.

This laft eruption occurred in February, 1794. It was the

the greatest and most copious ever known. It happened at the top of a hill, situated at the north point of Taman, near the bay of the same name. The appearance of the place seems to indicate that there had been a similar eruption at a remote period, for the ground that was not covered over by the last eruption, is of the same nature as the more recent sediments, being the same soil, with the difference only which vegetation and atmospheric influence must necessarily produce.

The place where the new gulf opened was a pool where the snow and rain-water usually remained for a long time. The explosion took place with a noise like that of thunder, and with the appearance of a mass of fire in the form of a sheaf, which lasted only about half an hour, accompanied by a thick smoke. The ebullition, which threw up a part of the liquid mud, lasted till next day, after which the mud continued running over slowly, and formed six streams, which made their way from the top of the hill to the plain. The body of mud collected by these streams is from six to ten feet deep, and may be reckoned more than a hundred thousand cubic fathoms! In July, the time when M. Pallas visited the place, the surface of those beds of mud was dry, extremely uneven, and cracked like clayey ground. The gulf that had vomited them was stopped up with the mud, which was likewise dry. It was not dangerous to walk over it, but it was frightful, as the horrid bubbling, which was then still heard in the interior of the hill, shewed that it was not so tranquil as at the surface. The mud thus discharged is always a soft clay of a blueish-ash colour, every where of the same nature, mixed with brilliant sparks of mica, and with fragments of marly, calcareous and sandy schist, which seem torn from the beds directly over the reservoir whence the explosion proceeds. Some crystals and sparkling laminæ of pyrites found in these fragments, prove that the heat of the reservoir was not sufficiently powerful to affect the beds which contained those pyrites, nor was the mud discharged from the gulf more than luke-warm. The appearance of fire, which M. Pallas heard described as accompanying the eruption, was probably inflamed hydrogen gas. He supposes that a bed of coal has for ages been on fire under Kercha and Taman, and that the sea at times breaking into the cavities, produces a quantity of steam, the expansion of which, and the generation of hydrogen gas, force open a passage for the mud, and drive it upwards in its ascent. This opinion we shall consider when we treat of the probable causes of volcanic eruptions in the present article. In the Penang Gazette of February 10, 1816, there is an account of a mud volcano of great extent in the island of Java, resembling in all the important particulars those described in Sicily and Taman. It is situated in the plains of Grobogno, N.E. of Solo, near the village of Kuhoo. The mud volcano, if it may be so called, forms an elevated plain, about two miles in circumference, which may be regarded as the crater. In the centre of this plain very large bubbles of mud rose, and swelled up to the height of ten or fifteen feet, which on bursting emitted volumes of dense white smoke. These large bubbles, of which there were two, continued to rise and burst seven or eight times in a minute, and often threw up two or three tons of mud. The smoke had the smell of sulphuretted hydrogen, or, as it is described, like the washing of a gun-barrel. As the bubbles burst, they threw out the mud round the centre with a noise occasioned by the falling of the mud on the plain, composed of the same mud. Smaller bubbles rose from some parts of the plain: from other parts round the large bubbles small quantities of sand were occasionally shot up to the height of twenty or thirty feet, unaccompanied with smoke. This was in parts where the mud was of too stiff a consistency to rise in bubbles. The mud in every part felt cold. The water which drains from the mud is collected by the Javanese, and exposed to the sun in the hollows of split bamboos, where it deposits common salt in crystals. This salt is reserved exclusively for the use of the emperor. In wet weather the brine is less strong than when the weather is dry. The phenomena attending all mud eruptions are very similar; in all of them, the muriate of soda (common salt) is either produced, or is itself an agent in producing the fermentation which is the immediate cause of the eruption. Though the great volcanoes in America sometimes throw out water and mud, as before noticed, they are properly fire volcanoes, into which water finds access. The water is generally hot, and its ejection only occasional.

Pseudo-Volcanoes.—The German geologists have given the name of pseudo or false volcanoes to those casual inflammations of beds of coal, that occasionally occur in coal districts, and continue in greater or less activity for many years. These inflammations are too trifling in extent or intensity, to be compared with true volcanic eruptions, nor do they present the same phenomena; for we have never seen a torrent of lava, however small, thrown out by any of these pseudo-volcanoes.

Beds of coal of considerable extent have been burning for many years near Bilston, in Staffordshire.

By the continued action of fire on the strata of clay and shale which accompany coal, some singular effects are produced, the clay becomes indurated, approaching to the state of jasper; and what is called porcellanous jasper is, in some instances, formed by these fires.

From some beds of coal, great quantities of carburetted hydrogen gas are evolved, which, when lighted, will continue to burn for a long time. In some parts of the world, streams of ignited inflammable air are emitted constantly, or at intervals, which possess the property of taking fire spontaneously on their access to atmospheric air: in all probability, these currents contain phosphuretted hydrogen gas, from which the property is derived. We consider these phenomena as distinct from volcanic fires.

On the south-east of Natolia, the mountain Climax, the Chimera of the ancients, situated near the Mediterranean sea, constantly emits flames from an aperture on the northern side. This appearance is unaccompanied by any detonation. It is very ancient, being mentioned in the Periplus of Scylax as continually burning.

The flames that are observed to issue occasionally during earthquakes, can scarcely be classed with volcanic phenomena; they appear to proceed from the sudden disengagement of hydrogen gas, combined with phosphorus, naphtha, and other substances, which may dispose it to ignite spontaneously. During the great earthquakes which desolated Thrace, Asia Minor, and Syria, in the fourth and fifth centuries, flames were seen to burst from the earth over a vast extent of ground. On the 26th of January, A.D. 447, subterranean noises were heard from the Black to the Red sea, and the earth was convulsed without intermission for the space of six months; in many places the air appeared on fire. Towns, large tracts of ground, and mountains, were swallowed up in Phrygia. On the 20th of May, A.D. 520, Antioch was overturned by a dreadful earthquake, and two hundred and fifty thousand of its inhabitants were crushed in the ruins. A raging fire covered the ground on which the town was built, and the district around, spreading over an extent of forty-two miles in diameter, and a surface of fourteen hundred square miles. Numerous instances of a similar kind are recorded by the historians

historians of that period. Flames were also observed to burst from the neighbouring mountains during the earthquake at Lisbon in 1755. Though these phenomena may proceed from subterranean fire as the primary cause, yet they differ from volcanic fires, as the latter throw out their contents in an ignited state; but the flames which accompany earthquakes, appear to arise from the ignition of vapour at the surface.

Burning and Extinct Volcanoes.—When we take a general view of the terrestrial globe, we observe volcanoes in every parallel of latitude, from Iceland and Kamtschatka, in the north, to Terra del Fuego in the south. They are more abundantly scattered over the ocean than the continent, and are more numerous in America than in the old world. They are found at every degree of elevation, from the depths of the sea to the summits of the Andes. Ancient volcanic craters, which have been for ages extinct or dormant, have left undoubted vestiges of their prior state of activity in various countries where no volcanoes at present exist; and volcanic rocks are found even where all vestiges of volcanic craters have been long obliterated.

Our knowledge of volcanic geography is at present imperfect, as a large portion of the earth's surface has not yet been examined; and our knowledge of volcanic islands in the Indian and Pacific oceans is confined to those which were in a state of active eruption at the time they were passed by navigators. Of the submarine volcanoes scattered over the bed of the ocean we have no account, and it is only when they occur in the vicinity of civilized countries, that we can ascertain their locality. At the beginning of the present century, the active volcanoes then known were stated at about two hundred. Travellers and navigators have since enlarged the number. Perhaps it would not be exceeding the fact, were we to estimate the number of active volcanoes in the world at one thousand, including all those which still preserve a considerable degree of heat, and present other indications that they are not extinguished, but dormant.

The only active volcano on the continent of Europe is Vesuvius. The Solfatara and Monte Nuovo in the vicinity may be regarded as dormant. History mentions a volcano in Albania, which destroyed Durazzo in 1269.

Of the European islands, Iceland is the most extensively volcanic, the whole soil of that country is apparently the product of fire. It contains six large active volcanoes, besides numerous smaller ones, and boiling springs.

Sicily contains Etna and the various volcanic mountains on its sides, with the mud volcano of Maccaluba.

Three of the Lipari islands are at present active: Stromboli, Vulcano, and Vulcanello.

Santorini and the neighbouring isles are evidently placed near or over a great submarine volcano, by which they have at different times been formed.

The island of Milo, about twenty leagues to the east of Santorini, has a volcano in an active state; the whole of the island is also stated to be volcanic.

The extinct or dormant volcanoes in Europe are far more numerous than those which are at present active. In Campania alone, between Naples and Cumea, in the space of twenty miles in length and ten in breadth, according to Breislak, there are no less than sixty craters, without reckoning those in the neighbouring islands, which are numerous. Some of the craters are larger than that of Vesuvius. The crater of Quarto even greatly exceeds that of Etna; its diameter is nearly two miles. The crater on which the ancient city of Cumea is situated, has thrown out a torrent of lava nine hundred feet broad, and from twenty-five to thirty feet in depth.

This crater belongs to a volcano extinct from the most remote ages. The foundation of Cumea was about twelve hundred years prior to the Christian era, hence Breislak adds, the last eruptions must have taken place more than three thousand years since, as the Greeks would not have founded their city on the mouth of an active volcano.

The other parts of Italy, from the Veronese and the Vicentin territory, with that of Padua, to the extremity of Calabria, are covered with the incontestible vestiges of ancient volcanoes.

Sicily presents a great number of extinct volcanoes, without reckoning those on the sides of Etna, of which some are equal to Vesuvius. Many of the Mediterranean islands, at present in a state of repose, have formerly been volcanic, as the islands of Elba, Sardinia, Ischia, Procita, the whole of the Lipari islands, with the greater part of the islands in the Grecian Archipelago. Lemnos was formerly regarded as the arsenal of Vulcan.

In Spain and Portugal there are volcanic craters still to be traced. The Souffriere of Conilla, near Cadiz, is an ancient volcano. The environs of Burgos are entirely composed of lava, pumice, and other volcanic products. The famous salt-mine of Posa, near Burgos, is stated to be situated in the midst of an immense crater.

In France there are numerous extinct volcanoes, as those of the Vivarais and Velay, described by Faujas St. Fond; and those of Auvergne, described by Daubuisson. The extinct volcanoes in Languedoc and Provence are said to be very numerous. The alps of Dauphiny, according to Lamanon, contain a crater of large extent.

There are entire chains of volcanic mountains on the banks of the Rhine, in the Brisgau, and the environs of Andernach.

The northern countries of Europe possess fewer indubitable vestiges of volcanic craters, though volcanic products and rocks, nearly allied to lavas, exist in various parts of Germany and Hungary, and are supposed by many geologists to be formed by subterranean fire, at a very remote period.

According to the Italian geologist Breislak, the famous gold and tellurium mine of Nagyag is situated in the crater of an extinct volcano. See TELLURIUM *Mines*.

In Great Britain, on the western side, particularly in the mountains of North Wales and Cumberland, are various circular cavities, partly filled with water, which bear a near resemblance to extinct craters. The rocks by which they are surrounded are generally a porphyritic trap, a rock which is supposed by many geologists to have had an igneous origin. See TRAP, and ROWLEY-*Rag*.

Above the village of Buttermere, in Cumberland, between the summits of the mountains called Redpike and Highstile, there is a large elevated crater of this kind, containing in its centre a small tarn or lake. The rocks which surround it consist of clink-stone-porphyry which melts with great facility, and porphyritic red felspar, and are in some parts rudely columnar. The side nearest the lake is broken down. We have no doubt, from an examination of the place, that it would be described by many geologists on the continent, as the well-defined crater of an extinct volcano. Von Buch, whose acquaintance with volcanoes is extensive, after a recent tour through this part of England, informed us that many of the mountains in Cumberland resemble those in Auvergne, and other parts of the world, which are supposed to have been softened and elevated by subterranean heat, without ever having flowed as lavas.

The basaltic hills of many parts of Scotland have been described by Faujas St. Fond as volcanic, and the basaltic

mountains and ranges in Ireland are ſuppoſed to have had a ſimilar origin. It is however doubted, by geologiſts of great repute, whether baſaltic rocks have all been formed by fire, and ſome deny altogether the igneous origin of theſe rocks. See SYSTEMS *of Geology*, BASALT, TRAP, and WHINSTONE.

The iſlands of Faroe, near Iceland, preſent more undoubted marks of their former volcanic ſtate.

On the continent of Aſia, few active volcanoes are known. According to the traveller Morier, there are ſeveral mountains in Perſia that conſtantly emit ſmoke. Ancient geographers alſo mention volcanoes in Thibet and Camboya. The mountain of Cophante, at the ſouth-eaſt extremity of the Caſpian ſea, is ſtated to be volcanic. There is a volcano at the entrance of the Red ſea, and another at the entrance of the Perſian gulf. From thence to Kamtſchatka we are not acquainted with any active volcano; but in this peninſula, according to count Beniowſki, there are not leſs than twenty, five of which are of immenſe ſize, called Awatcha, Joupanouſkaia, Chevelitche, Tobatchia, and Kamtchatka'ia. The three former are ſaid to be connected, and to have ſimultaneous eruptions; the latter ejects a great quantity of vitrified ſubſtances, which are found in its neighbourhood. It is of an immenſe height: the philoſophers who accompanied Peroufe were three days in reaching the crater, and it is ſaid to be viſible at the diſtance of three hundred miles. In the month of September 1737, torrents of burning matter flowing down on every ſide, preſented to the ſight the whole of the mountain as red-hot. Almoſt all the ſprings and lakes in this peninſula are more or leſs warm, hence they are never entirely frozen over, notwithſtanding the rigour of the climate. The chain of the Kurile iſlands, which may be conſidered as a continuation of Kamtſchatka, contains nine active volcanoes.

Kæmpfer, in his Hiſtory of Japan, deſcribes eighteen volcanoes in that and the neighbouring iſlands, and La Perouſe diſcovered two others.

In the Marianas, or Ladrone iſlands, nine volcanoes have been deſcribed. The Philippine iſlands, which are ſaid to exceed twelve hundred, are many of them volcanic. There are three volcanoes in Luzon, the principal iſland.

The archipelago of the Molucca iſlands abounds with volcanoes. Machian, one of theſe valuable ſpice iſlands, contains a remarkable volcanic mountain, which in 1646 was completely rent from the ſummit to the baſe, by the violence of its eruptions, and at preſent forms two diſtinct mountains, ſtanding near each other.

In the iſland of Ceylon, the peak of Adam is celebrated for its height and its volcanic eruptions.

In Sumatra there are four gigantic volcanoes, the higheſt of which is thirteen thouſand eight hundred and forty-two feet above the level of the ſea. The others are nearly of equal height. Several volcanoes occur in the iſland of Java. The iſland of Ternate affords alſo a volcano on the top of a mountain very difficult of acceſs, but opening with a vaſt mouth, and very terrible when it burns.

The ſeveral violent eruptions of this mountain have given it, within the mouth or crater, the appearance of an amphitheatre, conſtructed for holding people at the time of ſome public ſhow, ſeveral circles appearing in it one above another, formed with a ſort of regularity that is ſurpriſing. Modern navigators have diſcovered numerous volcanic iſlands ſcattered over the Yellow Sea and in the Pacific Ocean, from Aſia to the weſtern coaſts of America.

Of the extinct volcanoes of Aſia, excepting the northern parts, we have no accounts whatever. Patrin, an eminent French mineralogiſt, who viſited part of northern Aſia, ſays that hills of lava were ſeen after he had croſſed the lake of Baikal, fifteen leagues to the eaſt of the city of Oudinſk, near the river Kourba. All the country between Chilka and Argoune, which forms the river Amour, preſents traces of volcanoes. The mines of Gazemour are in the vicinity of an immenſe crater, the bottom of which is at preſent nearly on a level with the river. It is flat, and covered with blocks of ſcorified lava, from whence riſe ſeveral ſmall volcanic cones. On paſſing over this plain it returned a hollow ſound to the horſes' feet, as if they were travelling over a vault.

There are other larger craters on the ſummits of volcanic mountains, near the river Kourba, ſome of which are converted into lakes. Vaſt currents of lava deſcend from theſe craters; ſome of them are at preſent empty, others reſemble thoſe of Oberſtein and Deux Ponts, and are filled with chalcedonies and amygdaloidal ſtones.

When Hanno, the Carthaginian, coaſted Africa, he ſaw in the night-time fires aſcending from a lofty mountain called the Car of the Gods. Kircher, in his Mundus Subterraneus, mentions eight burning volcanoes on that continent, and the remains of many extinct ones. Our knowledge of the interior of this country is very imperfect, and no active volcanoes are at preſent known there.

From the accounts of ſome of the mountains near the Cape of Good Hope, we may infer that they have formerly been volcanic.

All the African iſlands are volcanic, or contain veſtiges of their igneous origin. No leſs than forty-two active or dormant volcanoes are found in the Azores.

The iſlands of Lanzerotta, Palma, and Teneriffe, contain burning volcanoes, and the other Canary iſles are volcanic.

The Cape Verd iſlands are alſo volcanic, but Fuego is the only one in which the fire is at preſent active.

The iſland of Aſcenſion, and the iſle of Bourbon, contain volcanoes. St. Helena and the Madeira iſlands preſent undoubted marks of their igneous formation.

The volcanoes on the continent of America are numerous, and of an immenſe ſize and height. They are principally ſituated near the weſtern coaſt. Ancient navigators mention volcanoes in Greenland with boiling ſprings, announcing a volcanic ſoil, ſimilar to that of Iceland. On the north-weſt coaſt of America, Capt. Cook ſaw a volcano in lat. 61°, and another of amazing height in lat. 55°, at the point of Alaſka. Another higher than the Peak of Teneriffe was diſcovered in lat. 59°. Others have been ſeen in various parts of the coaſt between Alaſka and California; but of the volcanoes in the interior, in theſe latitudes, we are unacquainted. Five volcanoes are enumerated in California. Proceeding ſouthwards, along the chain of mountains that forms the Cordilleras, we find the volcanoes ranged in rows nearly north and ſouth along a line of five thouſand miles in length, from the tropic of Cancer to Terra del Fuego. In the province of Quito the volcanic mountains diverge from this line eaſt and weſt, being ſcattered over a ſpace of ſeven hundred ſquare leagues, which is regarded by Humboldt as one enormous volcanic abyſs, covered with a cruſt of volcanic matter, and ſending forth eruptions from the numerous lofty craters, which are only different vents to the ſame internal fire. In New Spain alſo, there is a volcanic range, interſecting the Cordilleras in lat. 19°, and extending eaſt and weſt from the gulf of Mexico to the Pacific ocean. In this range, Colima and other ancient volcanoes, with the new volcano of Jorullo, are placed.

From the province of Quito the volcanoes are continued along the Cordilleras, in a direct line to the ſouthern extremity of America. The number of active volcanoes on this continent can ſcarcely be leſs than one hundred. Eighty-

Eighty-ſeven have been enumerated by former geographers, before Humboldt had extended our knowledge of the new world. From twenty-five to thirty were deſcribed as exiſting on the weſtern ſide of Mexico, before the new volcanic range of Jorullo was thrown up. Sixteen of the higheſt mountains in the world, in the province of Quito, are volcanic, but it is remarkable that they do not eject lava, but torrents of mud, which in drying form earthy ſtrata of many hundred ſquare miles in extent.

Of the extinct volcanoes in America we have little knowledge. La Condamine ſaw ſeveral extinct craters in Peru. It is thought by travellers, that ſome of the lakes in North America occupy the craters of extinct volcanoes of vaſt extent; this can only be determined by an examination of the rocks that ſurround theſe lakes. Extinct volcanoes are ſaid to occur in ſome parts of Canada.

The volcanoes in the American iſlands are very numerous. The long range of iſlands extending weſt from point Alaſka is altogether volcanic, according to the relation given by Sauer of the voyage of commodore Billings. One of theſe iſlands, called by the Ruſſians *Semiſopiabnoi*, or the ſeven mountains, contains ſeven volcanoes. The group of iſlands called Revillagedo are ſuppoſed to be volcanic, from the pumice found on the ſhores. The iſlands of Gallipagos are chiefly compoſed of ſcoriaceous lava, as we are informed by a gentleman who recently viſited them, and who favoured us with ſpecimens. On the eaſtern ſide, among the Antilles, the iſlands of St. Chriſtopher, Guadaloupe, Nevis, and St. Vincent's, contain volcanoes; and many of the other Weſt Indian iſles appear to be volcanic, though they have had no eruptions ſince they were firſt viſited by Europeans.

The volcanoes ſcattered in the Southern Pacific ocean can ſcarcely be claſſed with thoſe of the American iſlands. There are three very lofty volcanoes in the Friendly iſles, and among a multitude of iſles diſperſed over that vaſt expanſe of water, doubtleſs numerous volcanoes exiſt which are at preſent unknown. We have no account of volcanoes in New Holland.

This general outline of volcanic geography may ſuffice to ſhew how large a portion of the globe is at preſent, or has been formerly, ſubjected to the action of ſubterranean fire. It is the opinion of ſome geologiſts, that many of the ancient volcanoes which exiſted prior to the formation of the upper ſtrata, have been entirely covered by them and hid from human obſervation. In other inſtances, the craters of ancient volcanoes have been buried by the lavas of more recent eruptions, and in the great revolutions which have changed the appearance of the globe, volcanic diſtricts of vaſt extent have been broken down and the ſurface ſwept away, leaving only detached iſolated caps of volcanic matter on the ſummits of diſtant mountains, the ſolitary monuments of the former dominion of fire. Even volcanic mountains of later date have had their craters entirely obliterated by the united agency of mountain torrents and the eruptions of ſmaller volcanoes. In the iſland of Lipari, according to the deſcription of Spallanzani, the volcanic fires have raged ſo near to each other, that they have produced in every part confuſion and diſorder, which is ſeen in the groups of broken and half deſtroyed mountains. The ſubſtances ejected from the numerous eruptions have interſected each other, and intermingled ſo much, that no diſtinct volcanic crater can be traced at preſent. This confuſion has been further increaſed by torrents of rain, and by gradual diſintegration during a long ſeries of years.

From the volcanized ſoil of Lipari, from the preſent ſtate of the neighbouring iſlands, as well as from ancient tradition, we may with certainty infer that this iſland has been the former ſeat of volcanoes, though their craters are nearly obliterated. No geologiſt, who has viſited Lipari, ever entertained the leaſt doubt of its igneous formation. Volcanic glaſs and pumice, with which it abounds, are found on the Peak of Teneriffe, in Iceland, Kamtſchatka, and other volcanic countries; yet the followers of Werner have doubted or denied the igneous origin of theſe ſubſtances, becauſe they exiſt in baſaltic diſtricts, where no trace of a volcanic crater remains. This appears to be taking a limited view of the ſubject; for when we contemplate the preſent extenſive effects of fire in every quarter of the globe, and the great changes which have taken place on its ſurface, we may reaſonably infer the former exiſtence of volcanoes in all countries where the products of ſubterranean fire are found as native rocks, though no veſtige of a crater may remain, and the date of the eruption may be for ever loſt in the darkneſs of paſt ages, which preceded the emerſion of our preſent continents from the ocean.

Since the preceding article was written, we have ſeen the Hiſtory of Java, by lieutenant-governor Raffles, recently publiſhed; from which it appears that the whole of that large iſland, and moſt of the neighbouring iſles, are volcanic. There are no leſs than thirty-eight large volcanic mountains in Java, ſome of which are at preſent in an active ſtate. Theſe mountains all riſe from a plain, little elevated above the ſea. They are detached from each other, and though ſome of them are covered by the vegetation of many ages, the indications of their former eruptions are numerous and unequivocal. From the apertures in their craters, many of them continue to diſcharge ſmoke and ſulphureous vapours.

The following account is truly remarkable, as it is the only recorded inſtance of the natural death, if we may be allowed the expreſſion, of a large volcano.

"The Papandayang, ſituated on the weſtern part of the diſtrict of Cheribon, in the province of Suka-pura, was formerly one of the largeſt volcanoes in the iſland of Java; but the greateſt part of it was ſwallowed up in the earth, after a ſhort but very ſevere combuſtion, in the year 1772. The account which has remained of this event aſſerts, that near midnight, between the 11th and 12th of Auguſt, there was obſerved about the mountain an uncommonly luminous cloud, by which it appeared to be completely enveloped. The inhabitants, as well about the foot as on the declivities of the mountain, alarmed by this appearance, betook themſelves to flight; but before they could all ſave themſelves, the mountain began to give way, and the greateſt part of it actually *fell in*, and diſappeared in the earth. At the ſame time a tremendous noiſe was heard, reſembling the diſcharge of the heavieſt cannon. Immenſe quantities of volcanic ſubſtances, which were thrown out at the ſame time, and ſpread in every direction, propagated the effects of the exploſion through the ſpace of many miles.

"It is eſtimated that an extent of ground, of the mountain itſelf, and its immediate environs, fifteen miles long, and full ſix broad, was by this commotion ſwallowed up in the bowels of the earth. Several perſons ſent to examine the condition of the neighbourhood, made report that they found it impoſſible to approach the place where the mountain ſtood, on account of the heat of the ſubſtances which covered its circumference, and which were piled on each other to the height of three feet; although this was the 24th of September, full ſix weeks after the cataſtrophe. It is alſo mentioned, that forty villages, partly ſwallowed up by the ground, and partly covered by the ſubſtances thrown out, were deſtroyed on this occaſion, and that 2957 of the inhabitants periſhed. A proportionate number of cattle was alſo deſtroyed, and moſt of the plantations

ations of cotton, indigo, and coffee in the adjacent diſtricts were buried under the volcanic matter. The effects of this exploſion are ſtill very apparent on the remains of this volcano."

We have before ſtated that ſeveral circular lakes, of conſiderable extent, are ſuppoſed to have been formed in the craters of extinct volcanoes, but it ſeems more probable that theſe lakes cover the places where former volcanic cones, or whole mountains, have ſunk down. We have ſeveral inſtances of the partial deſtruction of the cone of a volcano, and ſome traditions are preſerved of the entire diſappearance of volcanic mountains, but the above is the only authentic record of ſuch an event in modern times.

The following narrative, extracted from the ſame work, deſcribes one of the moſt aſtoniſhing volcanic eruptions of which we have any knowledge. It took place in Sumbawa, one of the Molucca iſlands, in April, 1815.

"This eruption extended perceptible evidences of its exiſtence over the whole of the Molucca iſlands, over Java, a conſiderable portion of Celebes, Sumatra, and Borneo, to a circumference of a thouſand ſtatute miles from its centre, by tremulous motions, and the report of exploſions; while within the range of its more immediate activity, embracing a ſpace of three hundred miles around, it produced the moſt aſtoniſhing effects, and excited the moſt alarming apprehenſions. In Java, at the diſtance of three hundred miles, it ſeemed to be awefully preſent. The ſky was overcaſt at noon-day with clouds of aſhes; the ſun was enveloped in an atmoſphere, whoſe 'palpable' denſity the obſerver was unable to penetrate; ſhowers of aſhes covered the houſes, the ſtreets, and the fields, to the depth of ſeveral inches; and amid this darkneſs, exploſions were heard at intervals like the report of artillery, or the noiſe of diſtant thunder. So fully did the reſemblance of the noiſes to the report of cannon impreſs the minds of ſome officers, that from an apprehenſion of pirates on the coaſt, veſſels were diſpatched to afford relief. Superſtition, on the other hand, was buſily at work on the minds of the natives, and attributed the reports to an artillery of a different deſcription to that of pirates. All conceived that the effects experienced might be cauſed by eruptions of ſome of the numerous volcanoes on the iſland; but no one could have conjectured that the ſhowers of aſhes which darkened the air and covered the ground of the eaſtern diſtricts of Java, could have proceeded from a mountain in Sumbawa, at the diſtance of ſeveral hundred miles."

The lieutenant-governor of Java directed a circular to the different reſidents, requiring them to tranſmit to the government a ſtatement of the facts and circumſtances connected with this eruption, which occurred within their own knowledge. From their replies, the narrative drawn up by Mr. Aſſey, and printed in the ninth volume of the Batavian Tranſactions, was collected: the following is an extract from that paper.

"The firſt exploſions were heard on this iſland (Java) in the evening of the 5th of April; they were noticed in every quarter, and continued at intervals until the following day. The noiſe was, in the firſt inſtance, univerſally attributed to diſtant cannon; ſo much ſo, that a detachment of troops was marched from Djocjocarta, under the apprehenſion that a neighbouring poſt had been attacked: and along the coaſt boats were in two inſtances diſpatched in queſt of ſuppoſed ſhips in diſtreſs. On the following morning, however, a ſlight fall of aſhes removed all doubt as to the cauſe of the ſound; and it is worthy of remark, that as the eruption continued, the ſound appeared to be ſo cloſe, that in each diſtrict it ſeemed near at hand, and was generally attributed to an eruption, either from the mountains Merapi, Klut, or Bromo. From the 6th the ſun became obſcured; it had every where the appearance of being enveloped in a fog. The weather was ſultry, and the atmoſphere cloſe and ſtill; the ſun ſeemed ſhorn of its rays, and the general ſtillneſs and preſſure of the atmoſphere ſeemed to forebode an earthquake. This laſted ſeveral days. The exploſions continued occaſionally, but leſs violently, and leſs frequently than at firſt. Volcanic aſhes alſo began to fall, but in ſmall quantities, and ſo ſlightly, as to be hardly perceptible in the weſtern diſtricts. This appearance of the atmoſphere continued, with little variation, until the 10th of April; and till then it does not appear that the volcano attracted much obſervation, or was conſidered of greater importance than thoſe which had occaſionally burſt forth in Java. But on the evening of the 10th, the eruptions were heard more loud and more frequent; from Cheribon eaſtward the air became darkened by the quantity of falling aſhes; the ſun was nearly darkened; and in ſome ſituations many ſaid they felt a tremulous motion of the earth. An unuſual thick darkneſs was remarked all the following night, and the greater part of the next day. At Solo, candles were lighted at 4 p.m. of the 12th; at Magellan, objects could not be ſeen at three hundred yards diſtance. In other diſtricts more eaſtward, it was dark as night, and this ſaturated ſtate of the atmoſphere leſſened as the cloud of aſhes paſſed along, and diſcharged itſelf on its way. Thus the aſhes that were eight inches deep at Banyuwangi, were but two inches in depth at Sumenap, and leſs in Griſik; and the ſun does not ſeem to have been actually obſcured in any diſtrict weſt of Semarang.

"All reports concur in ſtating, that ſo violent and extenſive an eruption has not happened within the memory of the oldeſt inhabitant, nor within tradition. They ſpeak of ſingular effects in a leſſer degree, when an eruption took place from the volcano of Karang Aſam, in Bali, about ſeven years ago, and it was at firſt ſuppoſed that this mountain was the ſeat of the eruption. The Balineſe of Java attributed the event to a recent diſpute between the two rajahs of Bali Baliling, which terminated in the death of the younger rajah by order of his brother.

"From Sumbawa to the part of Sumatra where the ſound was noticed, is about nine hundred and ſeventy geographical miles in a direct line. From Sumbawa to Ternate is a diſtance of about ſeven hundred and twenty miles. The diſtance alſo to which the cloud of aſhes was carried ſo quickly as to produce utter darkneſs, was clearly pointed out to have been the iſland of Celebes, and the diſtricts of Griſik or Java; the former is two hundred and ſeventeen nautical miles diſtant from the ſeat of the volcano; the latter, in a direct line, more than three hundred geographical miles." On this narrative we ſhall remark, that the greateſt known diſtance at which volcanic eruptions had been heard before this of Sumbawa, was ſix hundred miles. According to Humboldt, the reports of Cotopaxi during ſome of its moſt violent exploſions, have been heard at a diſtance equal to that of Dijon in France, from Veſuvius.

A more accurate and extended knowledge of the effects of ſubterranean fire throughout the Aſiatic iſles and thoſe of the Pacific ocean, would probably demonſtrate that the intenſity of this powerful agent is not diminiſhed, as ſome philoſophers have ſuppoſed, though its preſent effects on the old continents may be leſs extenſive than in former ages.

Volcanic Fire.—The queſtions which have divided the opinion of geologiſts reſpecting volcanic fire are, firſt, What is the intenſity of the heat?—Secondly, Where is the

the fource of heat fituated?—And, laftly, From what caufe does it originate? Some philofophers contend, that volcanic heat greatly exceeds that of our common furnaces; whilft others affert that it fcarcely exceeds that of a culinary fire.

The arguments in favour of the low degree of heat of volcanic fire are founded on the experiments made upon lava in a common furnace, which was obferved to vitrify them more completely than volcanoes, and to melt many of the imbedded cryftals, which were fuppofed to have been left infufible by volcanic heat. M. Sage and Deluc firft fupported the hypothefis of the low degree of volcanic heat. M. Dolomieu endeavoured to prove it to be ftill lefs. His principal argument is the following. "It cannot be too frequently inculcated that lavas are not vitrifications; their fluidity is fimilar to that of metals reduced to fufion: when they ceafe to flow, they refume, like metals, the grain, texture, and all the characters of their primitive bafe; effects which we cannot produce on ftones in our furnaces, fince we know not how to foften them by fire, without changing the manner in which they are aggregated. The fire of volcanoes has not that intenfity which is fuppofed: the effect is produced rather by its extenfion and duration than by its activity." We greatly refpect the labours of this intelligent obferver; but we muft notice, that in the above ftatement he has not appreciated the important difference between the effects of volcanic fire and that of a furnace, refulting from the more rapid cooling of the materials in the latter cafe. It has been proved by the important experiments of fir James Hall, that vitrification depends not on the degree of heat fo much as on the rapid cooling of ftone or lava in a ftate of fufion; and that lava, vitrified in the furnace, affumes its ftony texture again, if it is remelted, and the heat be very gradually diminifhed. It was proved alfo by the interefting experiments of Mr. G. Watt, that if this procefs of cooling be continued for a ftill longer time, a cryftalline arrangement of the particles takes place.

It was an opinion long entertained, that the cryftals exifting in lava, whether of *felfpar*, *augite*, *olivine*, *leucite*, (fee thefe articles,) or other minerals, were original cryftals, exifting in rocks which had been fubjected to volcanic heat; and that this heat, though fufficient to melt the rock itfelf, was not powerful enough to melt the imbedded cryftals. It was fuppofed alfo, that fome of thefe cryftals, previoufly exifting, were found detached by the lava in its courfe, and buried in it. Thefe opinions, fo unphilofophical and improbable, are giving place to a more correct and enlarged view of thefe operations of nature.

The cryftals in lava did not previoufly exift, but were formed during the flow confolidation of the materials, which admitted the elementary particles to enter into different combinations, according to the laws of elective affinity and cryftalline arrangement, precifely in the fame way that different falts in the fame folution feparate from each other, and cryftallize. In the flags from our furnaces we may frequently obferve the fame procefs more or lefs perfectly completed; and we have feen cryftals refembling felfpar, found in a mafs of coal-fhale or bituminous flate-clay, which had been fufed and run down from the large ignited heaps, in the vicinity of Newcaftle-upon-Tyne. The facts adduced to prove the low degree of heat in volcanic fires, prove only its long continued action, and not its original degree of intenfity. Dolomieu indeed admits, that a great difference muft refult from the different periods of the continuance of heat. This was fubfequently demonftrated by the experiments of Spallanzani. He took feveral ftones, which had been found refractory, when expofed to a certain degree of heat for two or three days, and placed them in a glafs furnace where the fame degree of heat, was continued equally for more than fix weeks; during which time they were all more or lefs foftened by fire, and the vitrification, which began on the furface, extended deeper and deeper into the ftone, in proportion to the time. Hence, fays he, we may learn, that a long continued heat of lefs ftrength is as efficacious in the fufion of bodies as a ftronger heat of a fhorter duration. Dolomieu further conjectured, that the extreme fluidity of fome lavas was occafioned by the prefence of fulphur, which acted as a flux, in the fame manner as a bar of iron, when brought nearly to a white heat, will inftantly melt, if it be rubbed with fulphur; but this opinion was not confirmed by experiment. Spallanzani found that fulphur produced no effect, when mixed with ftone or lava, and expofed to heat; nor did the lava melt fooner than in other crucibles, in which it was expofed to the fame degree of heat.

The refult was the fame, whether he employed common fulphur or iron pyrites. The facts, therefore, adduced for the low degree of heat in volcanic fire, prove nothing; and it is only from the actual ftate of the lava itfelf, that its greater or leffer degree of intenfity can be afcertained.

The extreme liquidity of lava flowing from the crater, in fome inftances, has been fhewn in a former part of this article, where it is defcribed as fpouting up, and forming curves like a fountain of water. Profeffor Bottis relates, that on the 10th of September, 1776, he obferved a fmall hill on the fide of Vefuvius, formed of fcoriæ, and furrounded by lava recently ejected. In this hill was a fmall circular gulf, about three palms in diameter, and two in depth. From this gulf proceeded a low noife, fimilar to that of oil or any other fat fubftance fimmering over the fire; which found was doubtlefs produced, he fays, by fubftances fufing within it. The fire was fo ftrong, that fome fcoriæ being caft into it, immediately became red-hot, and melted, producing the appearance of boiling pitch. Spallanzani fays, that the fame kind of ftone required to be half an hour in the furnace before it was foftened; and in a reverberating furnace, it required a heat equal to the melting of iron, to obtain a fpeedy fufion of thefe ftones. It is likewife evident, that the heat in this fmall gulf, communicating with the cold air above, muft be lefs intenfe than in the internal part, fince this was only a fpiracle or vent to the great mafs of lava which boiled in the deep receffes of the mountain.

Spallanzani alfo obferved, that when the lava, placed in a common furnace, had been fufed feveral hours, and boiled over the edge of the crucible, its tenacity was ftill fo great, that he could fcarcely with all his force immerge a pointed iron-wire to the bottom; and when he took away the iron, the impreffion remained fome minutes, though the crucible ftill continued in the furnace. When the fame lavas were expofed to the intenfe heat of the reverberating furnace, they were more liquid, and might be penetrated with greater eafe.

From thefe experiments and obfervations we are warranted in concluding, that the heat of volcanic fires fometimes exceeds that of our moft violent furnaces, but that the lava of different eruptions may poffefs different degrees of fluidity and heat. It may alfo be worthy of notice, that the lavas were confiderably reduced in weight by remaining long in the furnace, the particles having been volatilized and fublimed. Another argument for the intenfity of volcanic fire is derived from the long continued heat of certain currents of lava. Spallanzani fays, when he paffed a detached current of lava near the fummit of Etna, which had flowed

eleven

eleven months before, it still retained a red heat, which was very conspicuous in some of the apertures even in the day-time; and a staff being placed upon it, immediately took fire. Ferrara states, that when the current, which flowed from Monte Rosso on Etna in 1669, was perforated at Catania in 1709, flames broke out, and it continued to smoke on the surface after rain, at the beginning of the present century. Now whatever may be the mass of a current of lava, the heat could not remain so great after such long intervals of time, were it not prodigiously more powerful when it first flowed. It is obvious that the heat of the internal fire cannot be less than that of the lava which flows from it, which, we have before observed, is sometimes equal at least to the heat of the most powerful reverberatory furnace. Where the lava possesses a much less degree of heat, we are not warranted in asserting that the internal fire was less intense; for various circumstances may modify and diminish the heat of the lava itself, such as the access of water near the surface, which may mix with it in the crater, and produce a torrent of mud, or may cool it so much as to increase its tenacity, until it can scarcely flow when it first issues from the crater. The following circumstance is well deserving attention. On opening some of the houses in Torre del Greco, which were nearly buried in the lava that flowed from the foot of Vesuvius in 1794, various striking effects were observed, which could only have been produced by the long continued agency of intense heat; effects which we have at present no means of imitating. Among others, even iron utensils had been partly volatilized, and crystals of specular iron-ore were formed on the surface. For a knowledge of this important fact, the public is indebted to the honourable H. G. Bennet, who brought away various specimens from the newly opened houses.

The question respecting the situation of volcanic fires may be thus stated:—Does the fire in volcanic mountains originate in the mountain itself, or is it situated at a great depth beneath the surface? It has been an opinion commonly entertained, that volcanoes originally break out in mountains already formed, and cover them with lava and scoriæ. Hence it is supposed by some philosophers, that there existed primitive or secondary mountains, where we now observe the Peak of Teneriffe and Etna, or Vesuvius, and that volcanic fire has merely covered the surface with its products, or effected a change in the external form of these mountains. On the other hand, it is contended that volcanic mountains are either entirely the products of subterranean fire, and have been formed by the lava and scoriæ thrown up, as was the case with the volcanic range of Jorullo in New Spain, and Monte Nuovo near Naples; or that they have been raised by subterranean heat, which has softened and upheaved the regular beds and strata that form the crust of the globe, as was the case at Malpays, already described; and on this upraised surface a volcanic cone has been formed, when the eruption of the volcano took place. To determine these questions, where history is silent respecting the formation of volcanoes, we must examine their structure at the base and the summit, and attend to the phenomena which accompany the eruptions. Some volcanic hills are so entirely composed of scoriæ and lava, that we can have no hesitation in believing that they have been formed by eruptions. This might be asserted of Jorullo, of Monte Rosso, and Monte Nuovo, if even we had no well authenticated accounts of their formation; and hence we may infer that the source of the fire is situated far below the base of these hills. Other volcanic mountains of larger size are partly composed of beds and strata, to which we cannot ascribe a volcanic origin. According to the observations of Mr. Leckie, during his residence in Sicily, calcareous strata, with marine organic remains, rest on beds of volcanic tufa, on the eastern side of Etna, and dip towards the sea. (Bakewell's Introduction to Geology, 2d edit. p. 316.) Hence we may infer that the primeval eruptions took place under the sea, and that their products of tufa were covered with marine deposits, before the mountain emerged from the ocean. In other words, the existence of the volcano preceded that of the mountain itself, the first eruptions taking place under the sea, the whole mass of the base having been upraised at a subsequent period. Calcareous beds occur in some of the Canary islands, which are all volcanic; and though the base of the Peak of Teneriffe, according to Humboldt, rises amidst a series of basalts and old lavas, he does not consider these as a progressive accumulation of lavas, but as having been formed under and elevated from the sea. On attending to the circumstances which accompany the formation of new islands, he says, we find that these extraordinary eruptions are generally preceded by a swelling of the softened crust of the globe. Rocks appear above the water, before the flames find their way or lava issues from the crater. We must, therefore, distinguish between the nucleus raised up, and the mass of scoriæ and lava thrown upon it. This, as we have before observed, is the case in some instances: there are others, however, in which pumice and scoriæ have been thrown up from under the sea; but both phenomena prove that the source of volcanic fire is seated at great depths below the surface of the ground. Were the source of volcanic fire seated in the mountain from which the eruption takes place, it is impossible to conceive that it could continue burning for some thousand years, without the mountain falling in; and when the fire was once extinct, it does not appear probable that it should ever burst forth again in the same place. M. Werner and his followers have placed the seat of volcanic fire in beds of coal; but as these occupy the upper strata of the globe, being situated above the primary and lower secondary beds, they can have no great comparative depth, and the objections just stated apply to this theory in full force. For if beds of coal were once burned out, or extinguished in one place, we can assign no conceivable reason why volcanic fires should break out in the same place again, after a cessation of seven hundred years, and should continue to burn for many hundred years afterwards, as was the case with Vesuvius. Indeed, the opinion of volcanic fire being derived from the ignition of coal-beds, appears to us a supposition altogether inadequate to explain their origin, and the extent of their operations.

Mr. Whitehurst, in his "Inquiry into the original State and Formation of the Earth," 4to. 1778, apprehends, that subterraneous fire must at different times have existed universally in the bowels of the earth, and that in union with water, or by the expansive power of steam, it has produced the immense continents, as well as the mountains of our globe, and also the universal deluge. When these fires were first kindled, by what sort of fuel they are still maintained, at what depths below the surface of the earth they are placed, whether they have a mutual communication, of what dimensions they consist, and how long they may continue, are questions which do not admit an easy decision. Some, with M. Buffon, have placed the seat of the fire of volcanoes towards the centre, or near the summit of the mountains, which they suppose to furnish the matter emitted. But if this were the case, that part of the mountain which is situated above the supposed seat of the fire, must be destroyed or dissipated in a short time; whereas an eruption usually

usually adds to the height and bulk of a volcano; and the matter discharged by it for many ages would be sufficient to form three such mountains as the simple cone or mountain of the existing volcano.

We have hitherto confined our account of volcanic phenomena to those circumstances which accompany the eruption in its immediate vicinity; but in order to form any rational or probable conjecture respecting the seat and origin of volcanic fires, we must take a more enlarged view of the subject, and contemplate volcanic fires in connection with each other, or in their effects on remote parts of the globe. Volcanoes and earthquakes are regarded as distinct phenomena, but they are only different effects of the same cause. Volcanoes are the vents through which is discharged the elastic vapour, and other materials, that, in a confined state, are the principal causes of earthquakes. Whenever these vents are by any means choaked up for a long time, violent commotions of the earth may be expected, until the former vents are re-opened, or new passages made for the confined materials to escape. This view of the subject may be illustrated by the following facts, which prove the immediate connection of earthquakes with volcanic fires.

The great earthquakes which have shaken Sicily and Calabria, have generally been accompanied with volcanic eruptions from Etna or the Lipari isles. In the year 1169, every house in Catania was thrown down by a violent earthquake, which occurred at the same time with a great eruption of Etna.

The earthquakes of 1634 and 1635, which nearly destroyed Messina, accompanied the memorable eruption from the same mountain, in which part of the volcanic cone fell down. The lava formed a torrent eighteen miles long, two miles broad, and twenty-four feet high. Immediately preceding the earthquake which destroyed Euphemia in 1633, Kircher, who was an eye-witness, says that Stromboli threw out an immense quantity of flames, accompanied with a noise which could be distinctly heard at the distance of sixty miles. The common eruptions from this volcano are comparatively feeble.

Near the time of the great earthquakes which destroyed Lisbon in 1755 and 1761, Europe, Africa, and America were repeatedly agitated by subterranean commotions, accounts of which may be seen by referring to the journals of that period. A few hours after the great shock of the former earthquake, the waters of Switzerland, Northern Europe, Canada, and the West India islands, were violently agitated, and fire was seen to rise from the midst of the Atlantic ocean. These efforts, nearly simultaneous, prove that the source of the commotion was seated deep within the globe.

The earthquakes of Cumana, in New Andalusia, are connected, says Humboldt, with those of the West India islands; and it has even been supposed that they have some connection with the distant volcanic phenomena of the Andes. On the 4th of November, 1797, the province of Quito suffered such a destructive commotion, that even in that thinly inhabited country, forty thousand of the natives perished, buried under the ruins of their houses, swallowed up in the fissures, or drowned in lakes that were suddenly formed. At the same period, the inhabitants of the Eastern Antilles were alarmed by shocks which continued eight months, when the volcano of Guadaloupe threw out pumice-stones, ashes, and gusts of sulphureous vapours. This eruption, during which long subterranean noises were heard, took place on the 27th of September, and was followed on the 14th of December by the great earthquake at Cumana.

The city of Caraccas was entirely destroyed by an earthquake on the 24th of March, 1812: violent oscillations of the ground were felt for thirty-five days after, both in the West India islands, and on Terra Firma. At this time the volcano in St. Vincent's, which had been dormant for near a century, broke out with great fury, covering the neighbouring islands with its ashes. On the night in which the cities of Lima and Callao were destroyed by an earthquake, four new volcanoes broke out in the Andes. Humboldt also states, that a column of dense black smoke, that had issued for several months from a volcano on the shore near Pasto, in 1797, disappeared at the very hour when the towns of Riobamba, Hambato, and Tacunga, sixty leagues to the south, were overturned by a most violent shock.

Numerous other instances might be cited, were it necessary, to prove the connection existing between the phenomena of earthquakes and distant volcanoes. The inhabitants in the vicinity of volcanoes are so well aware of this connection, that at Messina and Naples, and at the foot of Cotopaxi and Tungurahua, earthquakes are only dreaded when flames and vapours cease to issue from the craters; and what, says Humboldt, is very remarkable, the shocks appear to be stronger, as the country is more distant from burning volcanoes. The globe, it may be said, is agitated with greater force, in proportion as the surface has a smaller number of funnels communicating with the interior.

The catastrophe of Riobamba, in Quito, before stated, has led several well-informed persons to think that this unfortunate country would be less frequently desolated, were the subterranean fire to break the porphyritic dome of Chimborazo, and this colossal mountain were to become an active volcano.

The connection which distant volcanoes have with each other, and the vast extent to which the agitations of the ground are felt during eruptions, offer satisfactory proofs that the source of heat is not situated in the middle of volcanic mountains, but is placed far below them; or to speak familiarly, a volcanic mountain is not the fire-place, but the chimney-top. Our ideas of volcanic operations will be enlarged by contemplating the immense craters of ancient volcanoes which are either become extinct, or nearly so. From experiments made by Spallanzani to draw up the stones from the bottom of the sea between the islands of Lipari, Vulcano, and Salene, he learned that the ground was one continued mass of volcanic substances, precisely of the same kind as those on the shores of these islands. Hence he infers, that all the submarine ground between them has suffered the action of fire, in the same manner as that which is exposed to view, and these three islands are one continued group of volcanized substances, and have originally been formed by one central conflagration. That this eruption has been subsequently confined to three distinct mouths, which gave birth to the three islands. Humboldt has drawn nearly the same inference respecting the whole of the mountainous part of the province of Quito, which, he says, may be considered as one immense volcano, occupying seven hundred square leagues of surface, and throwing out flames by different cones, known under the denomination of distinct volcanoes, as Cotopaxi, Tungurahua, and Pichinca. In like manner, he adds, the whole group of the Canary islands is placed as it were over one immense submarine volcano. The fire makes its way sometimes through one, and sometimes through another of these islands in different parts. Now if we consider this opinion as correct, how vast and deep must be the volcanic abyss to which the mountains of Quito are only the different chimneys, placed over a thick crust of consolidated porphyritic lava. The volcanic crust which supports the Canary isles, must cover an abyss not less in extent and depth than that of Quito.

The range of volcanoes in the Andes, to the south of Quito, extends in a right line nearly two thousand miles; and if these have originally risen from one vast chasm, like the volcanic ranges of whose origin we have authentic records, it would not appear extravagant to suppose that this chasm may descend to the very centre of the globe. Some philosophers, indeed, contend for the existence of central heat in our planet, which gives rise to all the different phenomena of earthquakes and volcanoes. (See SYSTEMS *of Geology*.) We shall advert to this opinion in treating of the various explanations which have been given of the origin and support of volcanic fires.

In contemplating the impressive phenomena of volcanoes, and the great changes they have produced on the surface of the globe, we cannot be surprised that philosophers, ancient and modern, should have been anxious to discover the origin of these fires, and the means by which they are supported, but from the nature of the subject, their theories can be entitled to little more than the appellation of probable conjectures.

In all inquiries of this kind, it is important to bear in mind the essential distinction between the cause of any natural phenomenon, and the mode in which that cause operates. With the latter we may become well acquainted by attentive observation, while we remain profoundly ignorant of the former. Thus, when in volcanic operations we observe the expansive effects of heat, forcing a vent for the discharge of aeriform, fluid, or solid matter, we may infer that these effects do not differ in kind, but in degree only, from the same effects of heat when subjected to the controul of human agency; but we can draw no certain inference from hence respecting the origin of volcanic fire, or the substances by which they are kept burning for thousands of years with increased or diminished intensity.

The opinion formerly most prevalent respecting the origin of volcanic fire, was that it proceeded from the subterranean fermentation of certain materials which were disposed to inflame and explode spontaneously. When the decomposition of iron pyrites by water, and the spontaneous inflammation attending it was first observed, and particularly when the experiment of Lemery was known, where inflammation is produced by a mixture of iron-filings, sulphur, and water, it was imagined that a satisfactory explanation of the cause of volcanic fire was discovered.

In this experiment he mixed twenty-five pounds of powdered sulphur with an equal weight of iron-filings: and having made with water a paste of the mixture, he put it into an iron pot, covered it with a cloth, and buried it a foot under ground. In about eight or nine hours time the earth swelled, became warm, and cracked: hot sulphureous vapours were perceived; a flame which dilated the cracks was observed; the superincumbent earth was covered with a yellow and black powder; and, in short, a subterraneous fire, producing a volcano in miniature, was spontaneously lighted up from the reciprocal actions of sulphur, iron, and water. See *Artificial* EARTHQUAKES.

The above experiment has been often repeated; and it has been observed, that large quantities of the materials are not requisite to make the experiment succeed, provided there be a due proportion of water: half a pound of steel-filings, half a pound of flower of brimstone, and fourteen ounces of water, will, when well mixed, acquire heat enough to make the mass take fire. But it was known long before the time of Lemery, that natural mixtures of sulphur and iron would spontaneously take fire. These substances, it is well known, are supplied by the pyrites; a small quantity of which is sufficient to kindle a fire; a proper portion of water (for too great a quantity would extinguish the subterraneous fire) may be derived either from fissures and channels communicating with the sea, or from sources in the earth, wherein it is known to abound; and air, if it should be thought absolutely necessary to the spontaneous firing of the pyrites, may be conceived either to accompany the water, or to descend into the innermost parts of the earth through the fissures which are found on its surface. Or, if we suppose the heated pyrites to have been in contact with the oxyd of manganese and petrol, the flame may arise, as it is produced by art, from the desiccation of that substance, and its mixture with the mineral oil. That ore when heated affords oxygen gas, of which a very small quantity is sufficient to produce flame; and the flame, when once produced, may be supported by pure air from other ores, as Dr. Priestley has shewn (Obs. on Air, vol. iv. p. 210, &c.); and the inflammable matter, according to his system, may be supplied by pyrites, bituminous schistus, bitumen, and coal. After the eruption in any place, the volcanoes themselves serve for spiracles or air-holes, by which the subterranean fire may receive necessary supplies; so that these may serve to keep the magazines of internal fire in a due state, as well as to discharge the smoke and other matters with which it would otherwise be choaked up and extinguished.

Many of the regular strata are impregnated with iron and sulphur in the form of pyrites, and it was only necessary to provide for the access of water and air, to produce spontaneous inflammation. Thus the cliffs near Charmouth, in Dorsetshire, abound in pyrites, and after a very hot summer and heavy rains, they took fire, and continued burning slowly for a long time. These cliffs are principally composed of pyritous clay, forming part of the great stratum, called lias, in the west of England. See STRATA.

The abundant evolution of sulphuretted hydrogen gas from the decomposition of pyrites, tended further to confirm the opinion that ascribed to this cause the origin of volcanic fire. We conceive, however, that this theory is quite inadequate to explain volcanic phenomena on a great scale, such as the connection which distant volcanoes have with each other, the long continuance of the fire, and its breaking forth again in the same place, after it has ceased to burn for ages. Some phenomena, however, which are nearly allied to volcanic, and appear to be local, may be produced by pyritous decomposition. The eruptions of mud in the Crimea, and at Maccaluba in Sicily, may derive their origin from this cause, particularly as the matter thrown out is observed to contain particles of pyrites, whereas they have rarely, if ever, been observed in the matter erupted from fire volcanoes.

The inflammation of sulphur and bitumen has been supposed by some philosophers to occasion the various phenomena of volcanoes, but where do these substances derive the oxygen necessary to support their combustion? Spallanzani has conjectured that this may be obtained from various saline ingredients which yield their oxygen to heat, or it may be derived from the decomposition of water; but here we meet again with the same difficulty as before; how are the combustible materials renewed for ages in the same place? This would seem to require currents of liquid sulphur and bitumen to circulate through the interior of the globe, a circumstance which the theory of Spallanzani has not provided for, but which does not appear to us very improbable. This industrious observer could not detect the slightest smell of bitumen in the volcanic smoke of Stromboli, but according to Dolomieu and Humboldt, it is very perceptible in Vesuvius, and bitumen is even found in the recently erupted lava of that mountain. Sulphur, in its different combinations, is a constant product of all volcanoes.

According to the opinion of Spallanzani and others, the lava

lava and earthy products of volcanoes are formed of the internal beds of rock, which are melted by the inflammation of fulphur or bitumen, and thrown up by the violent preffure of elaftic vapour, either from fteam or more permanently elaftic fluids. From fome ingenious experiments, he afcertained that even the lava itfelf, at a certain temperature, partly affumes an aeriform ftate, and may then further contribute to the violence of thefe explofions, by which it is ejected from the crater.

It was the opinion of bifhop Berkeley, that a vacuum was made within the body of the earth by a vaft body of inflammable matter taking fire, and that the water, by communication with the fea, rufhed in, and was converted into fteam. However this be, it is certain, that by the procefs above explained, a vapour would be produced, whofe elaftic force is known to be feveral times greater than that of gunpowder; and, therefore, if the fuperincumbent weight were not too great, it might caufe earthquakes; and it would propel the matter melted by the fubterraneous fire laterally towards the mouth of the volcano, where meeting with leaft refiftance, it would expel it, together with all the unmelted ftony maffes which it found in its paffage. It is eafy to conceive, that before the denfe matter is ejected, the dilated air of the volcano will be firft forced out, and carry with it the afhes and loofer ftones adhering to the fides and crater of the volcano, in the manner obferved and defcribed by fir William Hamilton.

That fteam is one of the moft important agents in lifting up torrents of lava to fuch prodigious heights, has been generally fuppofed: it is even afferted that the fea has been obferved to retire in the bay of Naples previoufly to eruptions from Vefuvius; but this may, with more probability, be afcribed to the upheaving of the ground, than to the fudden abforption of water. Were the water to be abforbed ever fo rapidly, other water would inftantly flow on to fupply its place, fo that the apparent level of the fea from this caufe could not perceptibly vary, except for a few minutes. But if the ground were foftened and raifed up by fubterranean heat, the effect might continue for a longer time; and fhould even a fmall quantity of water find accefs through fiffures to the deep receffes of melted lava, this, by its rapid expanfion, might force up part of the lava to the fummit of the volcano, and produce the moft tremendous commotions.

According to the experiments of Spallanzani, water poured on the furface of melted lava, produced little effect, but when introduced under the furface, it occafioned a moft violent explofion. Similar effects are often feen in founderies; for if the moulds contain the leaft moifture when the melted metal is poured in, it is driven back with a loud report, and is violently difperfed in every direction. Thefe experiments, and the reafonings founded upon them, apply rather to the mode in which volcanic fires operate, than to the caufe of thefe fires. It feems exceedingly probable, that the fudden accefs of water, and the generation of immenfe volumes of elaftic vapour, may be the immediate caufe of moft volcanic eruptions. An explanation of the eruption of Etna, nearly fimilar to this, is given by the poet Lucretius.

"Præterea, magnâ ex parte mare montis ad ejus
Radices frangit fluctus, æftumque refolvit.
Ex hoc ufque mare fpeluncæ montis ad altas
Perveniunt fubter fauces: hac ire, fatendum eft,
Et penetrare, mari, penitus res cogit, aperto:
Atque efflare foras; ideoque extollere flammas,
Saxaque fubjectare, et arenæ tollere nimbos."

Lib. vi. l. 694, &c.

We have ftill however to feek for the origin of the fire itfelf, which this illuftration does not explain.

The caufe of volcanic fire muft probably be fought in the chemical combination of the elementary matter, of which mineral fubftances are compofed, and not in the combuftion of any inflammable materials like thofe which exift on the earth's furface. The folid products ejected from volcanoes are compofed of the different earths and alkalies; thefe are not fimple fubftances, but confift of metalline bafes and oxygen. Some of thefe metalline bafes, or metalloids, (as they have been called,) inftantly inflame on contact with water, and abforb the oxygen from it, whereby they are converted into earths or alkalies, having all the properties which the fame bodies poffefs in their natural ftate. (See POTASSIUM.) This important difcovery of fir H. Davy has been applied to explain the origin of volcanic fires. It has been fuppofed that the furface of the globe, formed of the different earths, may be regarded as its oxyded cruft, but that the internal parts are principally compofed of the metalline bafes of thefe earths; and whenever water finds accefs to them, they oxydate rapidly, and inflame, and are thrown up in the form of earthy lavas, &c. giving rife to all the various phenomena attending volcanic eruptions. This hypothefis, though fimple and ingenious, is not free from various objections. It is exceedingly difficult to conceive how fubftances fo inflammable and oxydable could remain for ages in a metallic ftate, protected from the accefs of moifture. Perhaps the difficulty we feel in admitting this may arife from our having obferved in the inflammation of potaffium by water, that the whole was almoft inftantly burned and diffolved; but were we to fuppofe a compact mafs of this fubftance to exift in the earth, of a mile or more in thicknefs, on the accefs of a limited quantity of water, the furface would inflame, and be reduced to an alkali, and form a cruft, which would protect the internal part from inflammation. Another current of water might diffolve this cruft, and again inflame the potaffium. By a fucceffion of fuch currents, the metalline beds in the earth may be fuppofed to be repeatedly inflamed, until the whole mafs was oxydized, when the volcanic fires would there be for ever extinct; unlefs we can conceive a procefs of deoxydation to take place, and reduce the earths and alkalies once more to a metallic ftate. The currents of electric light at the north and fouth poles may lead us to fufpect that electric agency is operative in the interior of the globe, and it would not appear contrary to analogies, were we to fuppofe that it may perform an important part in the procefs of deoxydation, and other chemical changes, which produce metallic veins, volcanic eruptions, and other geological phenomena. When the attention of philofophers was ftrongly drawn to the phenomena of electricity by the difcovery of the Leyden phial, in the middle of the laft century, it was fuppofed that this powerful and myfterious agent was the principal caufe of the phenomena of earthquakes. Ingenious and plaufible theories were framed, to explain its mode of operation, and its agency was extended to account for volcanic fires alfo. The quantity of electric matter evolved from volcanic fmoke in the thunders and lightnings which accompanied eruptions, were fuppofed to indicate that the difengagement of electric matter gave rife to all the phenomena of volcanoes. It may be obferved that the data on which thefe theories were formed was defective: the electric matter evolved from the fmoke and vapour of volcanoes was the neceffary effect of the fudden formation and expanfion of aeriform fluids: this is rendered fenfible when a fingle drop of water is converted into fteam, and muft be moft powerful when immenfe volumes of vapour are inftantly generated.

In our fpeculations refpecting the origin of volcanic fires, it

it is important to consider whether volcanoes are accidental appendages, or necessary parts of the terrestrial system, for "were we," as Mr. Bakewell observes in his Introduction to Geology, "to regard volcanic craters merely as the vents for subterranean fires, a further inquiry would arise respecting the utility of these fires. We cannot suppose that the interior motions of our planet are not directed to some definite purpose, with the same wisdom and design which are displayed in the external universe. The craters of ancient volcanoes greatly exceed any that are now active; and the quantity of matter thrown out must have been commensurate with the mighty openings through which it was ejected. Now these immense volcanoes, whose craters are many square leagues in extent, had doubtless an important office to perform in the economy of nature. It cannot, therefore, be unreasonable to suppose that the earth itself contains the great laboratory and storehouse, where the materials that form its surface are prepared, and from whence they were thrown up at different times, through these vast openings, either in the state of mud, or in chemical solution, or in the form of lava, or in the comminuted state of powders or sand. The only instances we have at present of rock formations are volcanic; the vast volcanoes in America throw out torrents of mud, which form strata of some hundred square miles in extent, and of considerable depth. And according to Humboldt, the further we trace back the ancient currents of lava, the greater similarity we find between them and those rocks, which are considered as primitive. These primeval eruptions took place when our present continents were covered by the sea or by large lakes, at the bottom of which they probably spread, and enveloped the remains of animals or vegetables, which we find buried in the different strata. Long intervals of repose might allow time for the growth of other tribes of animals, which were buried in the matter of succeeding eruptions. The internal fire acting with greater or less force on the strata already formed, might occasion these dislocations and contortions so frequently observed in primary and secondary rocks." This view of the subject is consistent with that system of geology which supposes the existence of a central fire in the globe, and it assigns to that fire its use in the vast chemical laboratory of nature. The existence of numerous active or extinct volcanoes proves the existence of this fire, their connection leads us to infer the great depth at which it is placed, and the production of new land offers no obscure indication of the final cause. The causes by which this fire is called into greater activity at certain periods, will probably for ever remain unknown; but it is important to keep in mind the essential difference between combustion and ignition. A substance may remain red-hot for ages without undergoing any change, if it be deprived of air, or the presence of other substances with which it is disposed to combine; but by combustion a chemical change is produced. A mass of melted iron or lava, inclosed within the globe, might remain unchanged for any conceivable time, if protected from air or water by a solid crust of the same material; and it is only on the contact of other substances, permeating or breaking through the crust, that the common effects of fire would be produced.

Granting a sufficient final cause for the existence of fire in the earth, the fact will not be more surprising than the emission of light and heat from the sun: of the manner in which either are generated, we are profoundly ignorant, as we are also of the nature and essence of heat itself. We are equally ignorant respecting the causes which have increased or diminished the intensity of subterranean fires at certain periods, and directed them to certain parts of the earth's surface. The variation of magnetic polarity may lead us to infer that there are regular processes taking place in the earth; and that it is not an inert mass, but a well-constructed machine, containing within it the materials and the means of its future renovation, directed by the same wisdom which guides its path in the heavens, and circulates the fluids through all the various forms of organic existence that inhabit its surface. Whether a time may arrive when the central fire, encreasing its activity, shall again reduce the present continents under its dominion, we have no natural means of ascertaining. The ancient Stoics, and many of the oriental philosophers, maintained the doctrine of the destruction and renovation of the world by fire; the sacred writers not unfrequently refer to the same event, announcing a period when "the earth shall be burned up, and the elements shall melt with fervent heat."

Dr. Hooke formerly had maintained, that all land was raised out of the sea by earthquakes; and many modern philosophers seem to admit his hypothesis, though not, perhaps, in its utmost latitude. Von Troil (Letters on Iceland, p. 222.) is of opinion that this island has been produced by volcanoes in the course of several centuries. Dr. Forster, in his Observations made during a Voyage round the World, p. 151. after giving an ingenious conjecture concerning the origin of all the tropical low isles in the South Sea, assures us, that of the higher isles there is hardly one of them which has not strong vestiges of its having undergone some violent alteration by a volcano. Some of them have volcanoes still subsisting; others, among which are Otaheite and Huaheine, seem to have been elevated, in remote ages, from the bottom of the sea by subterraneous fires. Sir William Hamilton is confident, that the island of Ischia, the whole basis of which is lava, rose out of the sea in the same manner as some of the Azores.

Dr. Priestley (Obs. on Air, vol. i. p. 263.) thinks it not improbable that the volcanoes, with which there are evident traces of almost the whole surface of the earth having been overspread, may have been the origin of our atmosphere, as well as (according to the opinion of some) of all the solid land. The superfluous phlogiston of the air, in the state in which it issues from volcanoes, may have been imbibed by the waters of the sea, which it is probable covered the surface of the earth, though part of it might have united with the acid vapour exhaled from the sea, and by this union have made a considerable and valuable addition to the common mass of air; and the remainder of this overcharge of phlogiston may have been imbibed by plants as soon as the earth was furnished with them.

The beds of lava are deepest and narrowest in the proximity of the crater, and broader and shallower as they are more distant, unless some valley intervenes; scoriæ and ashes lie still more distant. From these observations extinguished volcanoes are traced. Many excellent investigations of this sort may be seen in M. Soulavie's History of the South of France. For further information respecting volcanoes we refer to ÆTNA, STROMBOLI, SYSTEMS *of Geology*, VESUVIUS, and VULCANO.

Volcanic Products.—The substances thrown out of volcanoes, or found in the crater, are inflammable, saline, metallic, and earthy, without water, and may be classed as aeriform, fluid, or solid.

Aeriform Fluids.—Steam, or vapour, is frequently emitted in a quiescent state of the volcano, and is supposed to perform an important part during the most violent eruptions. Sulphuretted hydrogen gas is thrown out in great abundance from all volcanoes. Carbonic acid gas is emitted from some volcanoes in a quiescent state. Of the other gaseous or volatile

 substances

fubftances emitted during an active ftate of the volcano, we can only infer the exiftence from the fmell or from their being found in combination with the folid products of volcanoes; the principal of thefe are ammoniacal gas, muriatic acid gas, and fulphureous acid gas. Probably almoft every mineral fubftance which can be rendered volatile by heat, may be emitted in an aeriform ftate during violent eruptions; even the earthy matter of lavas is volatilized at a high temperature, as was proved in the experiments of Dr. Prieftley and Spallanzani.

Volcanic fubftances fluid at a heat below 212° Fahrenheit are water, which is fometimes thrown out in torrents: and fulphuric acid, found in fome volcanic water and bitumen, which has been obferved exuding from lavas at Vefuvius. Sulphuric acid, that abounds in fome water near volcanic mountains, is probably formed during a quiefcent ftate of a volcano, from the combuftion of fulphur in the crater, or in the upper receffes of the mountain. It is not difficult to conceive how the acid may become diffufed in the rain-water, or in that from melted fnow, which may permeate the porous rocks, and defcend in ftreams from a lofty volcano.

The folid fubftances ejected from volcanoes, or formed by chemical combination in the crater, comprife inflammable, faline, metallic, and earthy minerals. The three former are by far the leaft confiderable in bulk.

Sulphur is found in abundance in the craters of dormant volcanoes; its formation is attributed to the gradual decompofition of fulphuretted hydrogen gas, exhaled copioufly through fiffures from below. See Solfaterra and Soufrière.

Phofphorus is too inflammable to be found folid among apatite volcanic products; it is only from the white colour of the fmoke, from its peculiar fmell, and from its combination with lime in the mineral called apatite, found near fome volcanoes, that we can infer its exiftence as a volcanic fubftance. See Apatite.

Solid carbon has only been found in fmall quantities, in concrete bitumen in fome volcanic products. Carbonized wood and vegetable matter have been found occafionally in lava or tufa; in all probability they were enveloped during an eruption, and cannot therefore be regarded as volcanic fubftances. Carbon, in the ftate of mineral coal, has been fuppofed by M. Werner and his followers to be the principal fupport and caufe of volcanic fires; but this opinion is deftitute of all proof, and is at variance with all geological analogies.

The faline fubftances found in the craters of volcanoes, or formed by volcanic fire, are numerous, though not very abundant. Muriate of ammonia (fal ammoniac) forms an incruftation on many lavas foon after they cool. Muriate of foda (common falt) is found in fome volcanoes in confiderable quantities, even entire beds of rock-falt are found in volcanic craters, as at Pofa, near Burgos. Mount Cologero, near Sciacca, in Sicily, appears to be a volcanic mountain, impregnated throughout with common falt. Muriate of copper and of iron are found in fome volcanoes, as that of Vefuvius. Sulphate of iron and fulphate of copper, or green and blue vitriol, alum, gypfum, and fulphate of magnefia may alfo be enumerated among the faline fubftances found in volcanoes. See Sulphate *of Iron*, &c.

The metallic fubftances found in volcanoes, or among their products, are antimony, copper, gold, manganefe, mercury, iron, tellurium, and titanium.

Antimony is found combined with fulphur.

Copper is found native, and combined with fulphur, with iron, and with the muriatic and fulphuric acids, as before ftated.

Gold is faid to be found in fome volcanic products, and the gold-mine of Nagyag is ftated by Breizlak to be placed in the crater of a volcano. There is a gold-mine in the ifland of Ifchia, which is entirely volcanic.

Manganefe exifts in a fmall proportion combined with iron in obfidian and lava.

Mercury is found at Guanca Velua in great quantities, and it is faid the mine is fituated in the crater of a volcano. M. Patrin fuppofes that fome of the Cinnabar mines in Afia have a fimilar fituation.

Iron is abundantly diffufed through all volcanic rocks, which have a dark-brown, a black, or red colour. It forms one-eighth part of the fubftance of moft lavas. Iron exifts alfo in craters in the form of fpecular iron ore.

Tellurium is found with gold in the mines of Nagyag. See Tellurium *Mines*.

Titanium, combined with iron, appears, from the obfervations of Cordier, to be a conftituent part of almoft all dark-coloured volcanic rocks.

The earthy products of volcanoes confift principally of lava, obfidian, pumice, volcanic flags or fcoriæ, with volcanic fand, tufa, and we may alfo enumerate the earthy tufa formed of the indurated mud thrown out of the American volcanoes. Many geologifts enumerate bafalt and wacke among volcanic products, which they refemble both in appearance and in the nature of their conftituent parts. Various cryftallized minerals are found imbedded in lava, particularly augite, cryfolite, or olivine, felfpar, leucite, Vefuvian, and zeolite. (See Augite, &c.) Under the articles *Lava*, *Obfidian*, &c. are given fome account of thefe minerals.

The ftones firft thrown out of volcanoes are frequently pieces of granite or other primitive rocks, either untouched or only partially changed by fire. This circumftance proves that the feat of volcanic fire is far below thefe rocks. Scoriæ or volcanic flags are generally thrown out before the eruption of lava. Thefe flags are more or lefs vitrified; they fometimes take a globofe form in the air, and become confolidated before they cool. Thefe have been called volcanic bombs. Immenfe black clouds, confifting of pieces of fcoriæ and minute fragments and particles, fimilar to the fcoriæ, are thrown out with it. Some volcanic eruptions confift entirely of thefe powders or fand, which are driven to vaft diftances, and have been carried by currents of air more than five hundred miles from the volcano.

Vefuvius threw out fcoriæ and powders without any lava, for many centuries after the eruption in 79 A.D.

Lava.—Currents of melted ftone or lava, of twenty or thirty miles in length, from two to four miles in breadth, and from twenty to forty feet in depth, are found in volcanic diftricts, equalling in fize fome of the regular ftrata of the globe. The upper furface of thefe lavas is generally more or lefs veficular and fcoriaceous; and it is only where the beds have been broken or cut through, that the compact ftony fubftance of the lava can be feen. From this circumftance alone many philofophers have been led to doubt the volcanic origin of more compact rocks; but, as M. Cordier obferves, in a paper recently publifhed, "to judge of the fubftance of a current of lava, from what appears on the furface, would be like judging of a vat of wine from the froth with which it was covered." The cryftals imbedded in lavas were fuppofed by many geologifts to have exifted previoufly in the rocks which formed the lava, but were too infufible to be melted by the volcanic fire. On this erroneous fuppofition, they concluded that volcanic fire muft

muſt have poſſeſſed but a low degree of heat, as the ſame cryſtals may be melted in a common furnace. The formation of cryſtals does not depend upon the degree of heat, but on the circumſtances under which the ſubſtance cools; a long ſtate of quieſcent fluidity being as neceſſary to the formation of perfect cryſtals by igneous fuſion, as it is known to be in aqueous ſolutions. Inattention to this circumſtance has rendered many of the concluſions from the laborious reſearches of Spallanzani invalid. M. Cordier, an ingenious geologiſt in France, has deviſed a new mode of analyſing lavas. He very properly obſerves, that the attention of geologiſts has been hitherto directed more to the imbedded cryſtals in lava, than to the paſte or baſe of the lava itſelf; and it has been admitted, without ſufficient proof, that the baſe of lava was either hornblende or felſpar, or a mixture of theſe two minerals.

On attentively examining the ſubſtance of lava and volcanic ſcoriæ, with a very high magnifying power of the microſcope, he diſcovered that it was not homogeneous, but conſiſted of a congeries of minute cryſtals of different minerals, which were principally ſimilar to the larger imbedded cryſtals. To aſcertain more decidedly the nature of theſe ſmall cryſtals, he endeavoured to diſunite them by compreſſion, then ſelecting particles of the ſame ſize ſeparated them, according to their relative denſity, by waſhing. The iſolated particles were afterwards examined with the microſcope, and compared with the particles of the cryſtals moſt commonly found in volcanic rocks, ſuch as felſpar, cryſolite, olivine, iron-ſand, and menakanite. He commenced with the examination of compact or ſtony lavas, beginning with thoſe from burning volcanoes, then proceeding to thoſe from extinct volcanoes, and laſtly to thoſe whoſe volcanic origin has been doubted by geologiſts, ſuch as baſalt and wacke. The reſult of theſe examinations have led him to conclude, that all theſe rocks, from whatever diſtrict they come, are compoſed nearly in the ſame manner, and are all granular, conſiſting of very different diſtinct cryſtalline grains, interlaced with each other, ſo that all ſtony lavas may be regarded as minutely granitic, when viewed with the microſcope. There ſometimes exiſt minute pores between the grains, which however do not occupy one-ſixtieth part of the bulk: theſe pores are more common in modern than in ancient lavas.

There are five ſorts of theſe grains diſtinguiſhable by their colour; 1. white more or leſs tranſparent; 2. bottle-green; 3. black and perfectly opaque; 4. a clear brown; 5. and laſtly, very ſmall grains of reddiſh-brown. Theſe five ſorts of grains are ſuſceptible of further ſubdiviſion, according to their phyſical or chemical properties. The white grains belong to three diſtinct minerals. The moſt common are thoſe which melt into a white enamel; theſe are felſpar. The more infuſible are cryſolite, and thoſe which are perfectly infuſible are leucite.

According to the prevalence of felſpar, the lava poſſeſſes different characters. Thoſe which contain from forty-five to fifty-five *per cent.* of felſpar, melt into a black glaſs, the minute edges of which are bottle-green, black, or greyiſh-black; baſalts are of this kind.

Thoſe lavas which contain from fifty-five to ſeventy *per cent.* of felſpar, melt into a bottle-green enamel, ſuch are the greeniſh, greyiſh, and dark-coloured baſalts.

Stony lavas, which contain ninety *per cent.* of felſpar, melt into a white glaſs. Such are the petroſiliceous or compact felſpar lavas and clink-ſtone.

The yellowiſh or greeniſh grains belong to augite or to hornblende, which are ſometimes difficult to be diſtinguiſhed from each other. According to Cordier, the grains of augite are rounded and irregular, with a vitreous fracture and ſplendent luſtre. The grains of hornblende are long, and aſſume a priſmatic form: they preſent indications of their laminar ſtructure, and have little luſtre except in the direction of the laminæ.

The greateſt proportion of augite in lava is forty-five *per cent.* Theſe lavas melt into a black glaſs. Thoſe lavas which melt into a white glaſs only contain one *per cent.* of augite. The black opaque grains conſiſt of titanium combined with iron, as iron-ſand, *fer titané*, or as menakanite. The iron-ſand contains only 0.5 of titanium, the particles have a perfect metallic luſtre, and conchoidal fracture, and are attracted by the magnet. The greateſt proportion in which they exiſt in ſtony lavas that melt into a black glaſs, is fifteen *per cent.* The grains of menakanite exiſt in a much ſmaller proportion, they are difficult to melt, and are not attracted by the magnet.

The grains of iron ore, *fer oligiſte*, may be known by the red colour of the powder when they are pounded. Theſe are very rare in lavas.

From an examination of a great number of lavas, it appears that there are only two prevailing minerals which compoſe the greater part of their baſe. Theſe are augite and felſpar. All the reſt are in a very ſmall proportion; and hornblende, which has been admitted without examination into all volcanic rocks, exiſts but in a very few, and thoſe are ſuch as abound in felſpar. In the latter the cryſtals of hornblende, which are diſſeminated, are very diſtinct. Baſaltic rocks, which have hitherto been ſtated to conſiſt of hornblende and felſpar, according to Cordier, are principally compoſed of augite and felſpar.

Stony lavas may therefore be claſſed into two kinds, thoſe which melt into a white glaſs, and thoſe which melt into a black glaſs. The former M. Cordier denominates leucoſtine, the latter baſalt. Leucoſtine compriſes thoſe ſubſtances called, by Dolomieu, *petroſiliceous lavas*; by Hauy, *compact ſonorous felſpar*; by Karſten, *domite*, and *lava with a horn-ſtone baſe*; and by Werner, *clink-ſtone*. The latter compriſes the ferruginous lavas of Dolomieu; the baſaltic lava of Hauy, *les laves baſaltiques uniformes*; and the baſalt and lava of Werner. The reſult of theſe obſervations confirms the ſimilarity of compoſition between ſtony lavas of recent volcanoes and baſaltic rocks, whoſe igneous origin has been conteſted.

In the ſame manner M. Cordier has examined the compoſition of volcanic ſcoriæ and volcanic glaſs, volcanic cinders and tufa. Theſe are all compoſed of the ſame ſubſtances as the ſtony lava.

Obſidians, or volcanic glaſſes, may be divided into two kinds like lava, according as they yield a black or white glaſs to the blow-pipe. In the vitreous paſte of both may be diſcovered by the microſcope, the ſame cryſtals as in lava, grains of felſpar are ſeen in thoſe glaſſes which become white before the blow-pipe; grains of augite in thoſe which melt into a black glaſs. In certain inſtances, we ſee the tranſition of obſidian into a compact black baſalt, and alſo into pumice.

Theſe obſervations of Cordier tend to eſtabliſh the identity of baſaltic rocks with thoſe of volcanic origin, whilſt at the ſame time they diſtinguiſh them from the beds of hornblende and trap, which occur in primary mountains. The latter differ in compoſition from baſalts and lavas, and alſo in the nature of the imbedded cryſtals which they contain. All volcanic rocks, even thoſe which appear the moſt homogeneous, are compoſed in a great part of microſcopic cryſtals, belonging to a ſmall number of minerals, particularly augite, felſpar, olivine, and iron-ſand. Volcanic rocks

rocks of every age and country, that have flowed as lavas, or been ejected during fiery eruptions, are composed of the same mineral substances, and are different in their composition and internal structure from rocks which form the regular strata of the globe.

The external structure of lava is much diversified, owing, in all probability, to the different circumstances under which it has cooled. Some lava is porous, some contains large cavities or is vesicular, whilst other lavas are apparently compact, and assume a prismatic form. According to the observations of sir G. S. Mackenzie in Iceland, there are beds of lava of great extent, which appear never to have flowed in currents, but to have been completely fused in the situations where they occur. This lava was columnar in many places, the columns varying in size from a few inches to several feet in diameter. The surface of the lava was heaved up into large blisters and bubbles, some of which were round, and from a few feet to forty or fifty in diameter, others were long, and some were waved. A great many of the bubbles had burst, and displayed caverns of considerable depth. On this account sir G. Mackenzie denominates it *cavernous* lava. Currents of lava, which had flowed from volcanoes, covered the cavernous lava in many parts, but presented very distinct characters. In the common streams of lava, no defined approach to a columnar form was observed; but nothing was more common than the columnar structure in the cavernous lava. In some parts of Iceland were seen beds of amygdaloid, from ten to forty feet in thickness, alternating with tufa. The upper part of these beds did not indicate the action of fire, but the under part of each was a complete volcanic slag. From the situation of these beds, and other circumstances, it was inferred that they were lavas which had flowed under the sea. Some of the beds were very compact in the upper part. Another series of beds occur near Krisuvick, which was slaggy at the bottom, but so compact above as to resemble porphyry slate. Beds of very compact basalt, with the under surface slaggy, were also observed; and an extensive and beautiful range of lofty columns at Stappen present the same appearance, and have slaggy masses included in them. Sir George Mackenzie explains these appearances, by supposing the lava to have originally flowed over a cold wet surface at the bottom of the sea. An abundance of steam would constantly be produced from the upper surface, which would separate the hot lava from the water, in the same manner as a drop of water is kept detached from a plate of red-hot iron. Thus, no water could enter the substance of the lava from above, but the moisture below would operate very differently. From its conversion into steam, and the tendency to ascend, it would penetrate the fluid lava, and produce the porosity observed in the above rocks, and render the lava more or less vesicular, according to its degree of fluidity. When the lava is very hot and liquid, the steam will have less difficulty in penetrating it. In some instances it may allow the whole of the moisture to escape through it in the form of elastic vapour, so that the lava may become solid. According as the lava is more or less viscid, the steam may be more or less confined, making the stone porous or vesicular; and, lastly, the lava may be so tough, that the exertions of the elastic vapour may be confined to the lower surface of the beds. In the first case, a mass of compact stone would be formed, having no appearance of the action of fire. In the second case, the lava would form an amygdaloidal or vesicular mass. In the last case would result a mass entirely compact, except in the under-surface. (Travels in Iceland, by sir G. S. Mackenzie.) In the formation of volcanic rocks, which have flowed as lava under the sea, very different results would take place from the formation of similar rocks on land, owing to the great difference which the superincumbent pressure of a deep volume of water would occasion; and as most of the ancient currents of lava have in all probability been originally submarine, we may expect them to vary in structure from the lavas of more recent eruptions. In the Transactions of the Royal Society of Edinburgh are several valuable papers of sir James Hall, detailing a series of the most interesting and instructive experiments on the effects of heat modified by compression. These experiments merit the profound attention of every one who would endeavour to form a just and comprehensive view of the agency of subterranean fire on the different rocks which form the crust of the globe. For the result of some of these experiments, we refer to SYSTEMS *of Geology*; but we particularly recommend our readers to peruse the original papers, which are well illustrated by a series of plates.

The minerals which line or fill the cavities of vesicular lava are principally varieties of zeolites, chalcedonies, and calcareous spar. Quartz crystals abound in some of the vesicular lavas of Lipari. All these minerals are supposed, with much probability, to be of posterior formation to the lava itself, and to derive their origin from the infiltration of water, holding the constituent parts in solution or suspension. Spallanzani conjectures that the particles are separated from the lava itself, by the decomposing effects of sulphureous acid.

Lava is subject to decomposition from atmospheric agency, according as it is more or less vitreous. Some lavas are known to have resisted all tendency to decompose for many centuries; other lavas decompose rapidly, and form a productive soil. Particular vegetables possess the property of reducing lava to vegetable mould with great rapidity. The Indian fig, or, as it is commonly called, the prickly pear, has this property in a remarkable degree. According to the account of it given by General Cockburn, in his "Travels through Sicily," this plant pulverises the hardest rocks, and forms the most luxuriant soil. The inhabitants bring a little earth to any crevice of lava, and plant a prickly pear-tree in it, which spreads and splits the rocks in about seven years. A thick plantation is thus formed, and a very little earth being added, in about ten years more the rock is pulverised for some inches deep. Vol. ii. p. 163.

Obsidian or *black volcanic glass* appears to be a vitreous modification of stony lava, produced by its sudden refrigeration. According to the observations of Cordier before stated, it may consist either of felspar or augite, as forming the principal part of the base. The volcanic origin of this mineral has been denied by some geologists without any apparent reason, except an attachment to theory; for this substance may be traced flowing from the craters of volcanoes, and passing into compact black lava or basalt, and also into white spongy pumice. Sir James Hall and Dr. Home visited a mountain in Lipari, that had escaped the attention of Dolomieu. From several openings in this mountain a stream of obsidian and pumice might be traced: they gradually passed into each other. The pumice had evidently flowed with the obsidian, as it formed the upper surface of the stream. The greatest breadth of the stream was about two miles and a half, and its length three miles. It seemed to have been produced by the last effort of the volcano. Sir G. Mackenzie discovered a stream of obsidian in Iceland, filling up a valley to the depth of thirty feet, and visible for more than two miles in extent. The surface was in many parts covered with pumice. Obsidian is found streaming from the crater of Vulcano: it exists in abundance

dance at Teneriffe, Kamtſchatka, and various volcanic countries; but it is by no means ſo common a product as ſtony lava.

The objections to the volcanic origin of obſidian, founded on its loſs of colour, and its tumefaction at a low degree of heat, are deprived of their force by the diſcoveries of ſir James Hall before mentioned. Theſe experiments prove, that a ſtone, which was not fuſible under a heat of thirty-eight degrees of Wedgewood's pyrometer, yields a glaſs that ſoftens at fourteen degrees; and when this glaſs is re-melted, and acquires a ſtony texture by ſlow cooling, it cannot be fuſed again with a leſs degree of heat than thirty-five degrees.

Pitch-ſtone (ſee PITCH-*Stone*), though leſs vitreous in its appearance than obſidian, yet, viewed by the geologiſt as it exiſts in nature, cannot be ſeparated from it, but muſt be claſſed as a different mode of the ſame ſubſtance, or as vitreous lava. The baſe of the Peak of Teneriffe, to the plain of Ketama, is buried under ſcoriæ and heaps of pumice reduced to powder. From thence to the ſummit of the mountain, or from fifteen hundred to nineteen hundred toiſes in height, the volcano exhibits only vitreous lavas, compoſed of obſidian and pitch-ſtone more or leſs porphyritic: they are of blackiſh-brown, often varying to the deepeſt olive-green; they contain large cryſtals of felſpar. The analogy of theſe decidedly volcanic ſubſtances with the pitch-ſtone porphyries of the valley of Turbach in Saxony is, ſays Humboldt, very remarkable; but the latter contain quartz, which is wanting in the modern lava. When the lava changes from pitch-ſtone to obſidian, the colour is paler; ſometimes both varieties occur in the ſame fragment. Among the pitch-ſtone and lava, near the ſummit, were found blocks of real greeniſh clink-ſtone porphyry, ſimilar to the porphyry-ſlate of the mountain of Belin, in Bohemia. Theſe facts further prove the connection between rocks of the trap formation and volcanic products. (See TRAP.) Obſidian and pitch-ſtone are found in Hungary, in Mexico, and in Quito, at a great diſtance from burning volcanoes. Pitch-ſtone exiſts abundantly in ſome of the Scotch Hebrides, particularly in the iſle of Eigg. In South America, obſidian is ſcattered over the fields in angular pieces, and ſometimes forms iſolated rocks. The Mexicans dug obſidian in mines, and made knives, ſword-blades, and razors of this mineral. The Guanches in Teneriffe made ſpear-heads of obſidian; it was alſo employed by them, and by the Mexicans, in the fabrication of mirrors and ornaments for the women. Various volcanic glaſſes, differing in colour and from obſidian, occur in ſome volcanoes, particularly that of the iſle of Bourbon. Theſe may, however, all be claſſed with vitreous lavas, as it appears from the experiments of M. Cordier, that the conſtituent parts of all are the ſame, being principally compoſed of varying proportions of augite and felſpar.

Pumice (ſee PUMICE) is an abundant product of volcanoes: it may be conſidered as light ſpongy lava, under which term is compriſed a great variety of volcanic ſubſtances, differing in poroſity, in texture, and in colour. The term *pumice-ſtone* indicates a capillary or fibrous texture of lava. It appears to be the product of intenſe heat, operating either on lava or obſidian; the lighter coloured pumices being formed of thoſe volcanic rocks which abound in felſpar, or rather it is the elements of theſe rocks in a capillary form. As ſome obſidian ſwells greatly, and loſes its colour by heat, it was inferred that all pumice has been formed from this mineral; but the concluſion is too general. There are numerous inſtances in which obſidian may be traced paſſing into pumice; but there are other inſtances in which ſtony lava, abounding in felſpar, may alſo be traced paſſing into pumice-ſtone. Some experiments made by Humboldt prove that different obſidians ſwell very unequally, when expoſed to the moderate fire of a forge. Thoſe from the Peak of Teneriffe, and the black varieties from Cotopaxi, increaſed in bulk more than five times. The red varieties from the Andes, on the contrary, were not much tumefied by heat. We have already ſtated inſtances of currents of obſidian covered with pumice, and of maſſes of obſidian paſſing into pumice, ſo as to leave no doubt of the formation of pumice from obſidian. Nor are there wanting inſtances as deciſive of lava paſſing into pumice. This cannot, on reflection, appear ſurpriſing, as obſidian and lavas are eſſentially the ſame ſubſtances in a vitreous and ſtony form. Spallanzani deſcribes a lava with a baſe of felſpar, which is ſpread over a part of Lipari, riſing in rocks and craggs of enormous ſize: it is of a grey colour. On attentively examining this lava, the gradual tranſition into pumice may be diſtinctly perceived. It is not uncommon to find maſſes of this lava, which on one ſide retain the character of felſpar, and on the other are changed into white pumice, exactly reſembling that of Campo Bianco in colour, lightneſs, ſtructure, and other characters. Some of the white pumices of Campo Bianco are ſo compact, that the ſmalleſt pore is not viſible to the eye; but when viewed through a lens with a ſtrong light, they reſemble an irregular accumulation of flakes of ice: their compactneſs, however, does not prevent their ſwimming on water. Other pumices were full of pores and vacuities of a larger ſize, and their texture is formed by filaments arranged parallel to each other, and of a ſilvery whiteneſs: both theſe varieties may ſometimes be ſeen in the ſame ſtone; hence we may infer that the difference ariſes from the action of elaſtic fluids producing different degrees of dilatation, when the maſs was in a fluid ſtate. There is a black pumice in Lipari, compoſed of parallel filaments, that all lie in one direction, which is that of the bed deſcending from the mountain to the ſea. This, ſays Spallanzani, may be conſidered as a true current of pumice. The black colour he ſuppoſed to proceed from ſome bituminous ſubſtance, as a ſtrong ſmell of bitumen is emitted, when two pieces of this pumice are rubbed together. The black colour was entirely loſt by expoſure to heat for ſome time in the furnace, which reduced it to a vitreous paſte. Humboldt conjectures that the dark colour of ſome obſidians is cauſed by a hydruret of carbon.

Nature, ſays Humboldt, probably employs different means to produce the ſpongy and vitreous pumices of Teneriffe, the pumices with parallel fibres from the Lipari iſlands, and the capillary vitrifications of the iſles of Bourbon, which ſometimes reſemble a ſpider's web. Theſe differences probably conſiſt in the different degrees of heat, in the different preſſure under which the fire acts, and in the nature of the rocks altered by it. Above all, ſays the ſame traveller, the preſſure which obſidians undergo in their fuſion, explains why theſe ſubſtances, with ſome exceptions, are never found whitened. Thoſe pumices, which have the appearance of having been formed at great depths, are fibrous, and of a ſilky luſtre. Blocks of this kind on the Andes, of eight or ten toiſes in length, have the fibres exactly parallel with each other, and perpendicular to the direction of the beds. Several volcanoes do not throw out any pumice; and thoſe that do, eject them only by their crater after the flowing of the lavas.

Volcanic Sand.—The white powders which have been called aſhes are generally thrown out the laſt, and indicate the end of the eruption; they conſiſt entirely of white pumice ground to powder. The black powders iſſue the firſt, and, being

being driven with greater force, are carried to a greater diftance from the mountain. Thefe powders are called by the Italians black and white rapilli.

Volcanic fcoriæ or *flags* differ from pumice by their greater denfity; they are properly maffes of cellular lava, and are more or lefs vitreous or ftony, according to the degree of heat to which they have been fubjected, and the circumftances under which they have cooled. The upper part of modern currents of lava, that have flowed in contact with the atmofphere, are generally compofed of fcoriæ. The compofition of fcoriæ is the fame as that of lava, and varies with the different lavas from which it is formed.

Volcanic tufa appears to be formed of the loofe fand or powders, together with the fmaller fragments thrown out of volcanoes, which are fpread over the furface of the ground, and afterwards become partly confolidated by water and preffure. In all fubmarine volcanoes, thefe powders muft be mixed with water as foon as they are difcharged from the mouth of the crater, and muft therefore fall as a muddy fediment over the bed of the ocean, and form ftrata of tufa of greater or lefs extent according to the quantity of matter ejected. The materials of which the powders are formed, may alfo have been mixed with water in the deep receffes of the volcano, and have been difcharged in torrents of mud like thofe which iffue from the American volcanoes. In this way beds of tufa of great extent have probably been formed, and as they fometimes take the fame fhape as the original inequalities of the ground, it has been fuppofed that they have flowed as lavas. Spallanzani defcribes a bed of tufa in Lipari which covers the furface of the hills and valleys nearly equally; but it would be difficult to conceive how a ftream of mud could afcend a hill, were it ever fo tenacious. If the matter were depofited from the turbid waves of the ocean, we fhould have no difficulty in accounting for its prefent appearance, and alfo for the ftratifaction of tufa alternating with beds of lava. Volcanic tufa, in its more indurated ftate, is ufed as building ftone; foft or incoherent tufa has received the names of puzzolana, tarras, &c. See PUZZOLANA.

Volcanic tufa compofes the principal foil of many volcanic diftricts. A great part of mount Etna and the mountains on its fides are compofed of this tufa.

Hills of tufa, according to fir G. Mackenzie, invariably accompany lava in Iceland. Whole ranges of mountains are formed of it, and wherever eruptions have occurred, thefe hills of tufa may be feen. It clofely refembles the tufa of Sicily and Italy. The tufa of Iceland often alternates with fubmarine lava, and then it invariably includes maffes of lava and flags, more or lefs rounded by the action of water. The beds of tufa are fometimes not lefs than forty feet in thicknefs. When tufa alternates with beds of amygdaloid trap and greenftone, it includes maffes of thefe fubftances. The fubmarine lavas which alternate with tufa, are always above the beds of trap and greenftone alternating with the fame fubftance. Sir G. Mackenzie conjectures that they are all the products of fubmarine volcanoes, but that the beds of trap and greenftone were firft erupted at a greater depth under the fea, and under a greater compreffive force; to which caufe the difference in their ftructure from that of the upper beds is to be attributed: hence the lower beds, being more compreffed and compact, have loft the appearance of the immediate action of fire which is fo vifible in the cellular lava and flags nearer the furface. Mountains of tufa, one thoufand feet in height, occur in Iceland, and even whole mountain ranges are compofed of the fame material; in thefe there is no appearance of regularity, but all the mafs is heaped up in confufion. The prevailing colour of the pafte of this tufa is yellow; and, in a defcription given by Mr. Stephenfon of an eruption from one of the Icelandic volcanoes, called the Kattlagian Jokul, we have an inftance of its actual formation. "The fand which fell afterwards united, and covered the meadows with a yellow-coloured cruft, quite compact."

The mud thrown out of the American volcanoes, when indurated, may be claffed with tufa; but befides the earthy ingredients, it contains a portion of carbonaceous and faline matter. To fome intermixture of this kind, the fertilizing properties, afcribed to the fine fand or powder recently ejected from the volcano at St. Vincent's, may perhaps be attributed.

Puzzolana and *terras* are thofe foft tufas which are ferruginous, and poffefs the property of confolidating under water when mixed with lime as a cement. This property is derived from the iron, and is common to many of the argillaceous limeftones of England that abound in iron.

From the experiments and obfervations of M. Cordier before ftated, it appears that the different earthy products of volcanoes, whether as ftone in the form of compact, veficular, or amygdaloidal lavas, or in a ftate of perfect vitrification as obfidian, or lefs perfectly vitrified, as fcoriæ, or in the earthy form of wacke or volcanic tufa, or in beds of fand formed of minute detached grains or particles, are all compofed principally of augite and felfpar in different proportions.

This view of the fubject tends greatly to fimplify our knowledge of volcanic products, as all the earthy maffes and rocks ejected from volcanoes, however differing in ftructure, denfity, and colour, are to be regarded only as different aggregations of the fame mineral fubftances, modified by the various effects of heat and compreffion, and the operation of thefe caufes to which they have been fubjected fince their firft eruption.

Various rocks which have been claffed under the unfcientific denominations of fletz trap rocks and greenftone are alfo compofed of the fame mineral fubftances aggregated in a fimilar manner; hence we may infer that they have had a fimilar origin. Thefe rocks are very extenfively fpread both in volcanic diftricts, and in countries remote from any active volcanoes; they ferve as monuments to elucidate the natural hiftory of the globe, and to mark the boundaries of the ancient dominion of fire over the prefent continents.

VOLCANOES *in the Moon.* Dr. Herfchel, now fo well known and univerfally celebrated, on account of his various aftronomical obfervations, difcovered, on the fourth of May, 1783, a burning volcano in the moon. This difcovery confirms the conjectures formed by M. Æpinus, in 1778, and publifhed in a memoir printed at Berlin in 1781, concerning the volcanic origin of the inequalities in the moon's furface. Similar ideas occurred to profeffor Beccaria, of Turin, nearly at the fame time, and alfo to profeffor Lichtenberg, of Gottingen. The nephew of profeffor Beccaria difcovered, Oct. 11, 1772, a luminous fpot on the moon, during its total eclipfe of that night, in or near the place marked Copernicus; and from this time the profeffor mentioned this obfervation in his public lectures, as an evidence that the round cavities on the furface of the moon were fo many craters of diftinct volcanoes; adding, that he confidered thofe ftraight radiations, or bright paths, which are obferved particularly on the place of the moon marked Tycho, as fo many torrents of the lava, which fpouted off in fome former conflagration of a volcano.

The reader may fee this account, given by the profeffor himfelf, in a letter concerning the luminous appearance obferved by don Ulloa on the moon, during the total eclipfe of the

the sun, June 24, 1778; in which he maintains, that such a luminous spot was an actual burning volcano, and not a real hole through the mass of the moon, as Don Ulloa asserted it to be. This letter is inserted in the Journal de Physique for the month of June, 1781. M. Æpinus observes, that the opinion of volcanoes in the moon was first suggested by Dr. Hooke, in his Micrographia, printed at London in 1665; in the twentieth chapter of which work he speaks at large concerning this opinion.

Dr. Herschel, on the 4th of May, 1783, discovered two small conical mountains in the very same spot where he had observed the volcano: these are situated in the Mons Porphyrites of Hevelius, just by a third mountain, much larger, which Dr. Herschel had often observed before. (See Gent. Mag. for August, 1784, p. 563, &c.) On the 19th of April, 1787, the same ingenious and indefatigable observer discovered three volcanoes in different places of the dark part of the new moon. Two of them were nearly extinct, or in a state ready to break out. The third shewed an actual eruption of fire, or luminous matter. From another observation he infers, that the diameter of this volcano cannot be less than 3″, and that the diameter of its burning part is equal to at least twice that of the third satellite of Jupiter, with which it was compared. Hence the shining or burning matter is computed to be above three miles in diameter. Phil. Trans. vol. lxxvii. part i. p. 230.

VOLCHOVA, in *Geography*, a river of Russia, which rises in the Ilmen lake, and runs into lake Ladoga, at Nov Ladoga.

VOLCHOVSKOI, a town of Russia, in the government of Tobolsk; 32 miles E. of Surgut.

VOLCI, in *Ancient Geography*, a town of Italy, in the interior of Etruria. Ptol.

VOLCI. See VOLSCI.

VOLCIANI, or VOLSCIANI, a people of Hispania Citerior, celebrated on account of the determined reply which they made to the Roman ambassadors, when they solicited them to renounce their alliance with the Carthaginians.

VOLCKACH, in *Geography*, a town of the duchy of Wurzburg, on the Maine; 11 miles N.E. of Wurzburg. N. lat. 49° 54′. E. long. 10° 14′.

VOLCKERSBERG, a town of Westphalia, in the bishopric of Fulda; 12 miles S. of Fulda.

VOLCKMANNSDORF, a town of Silesia, in the principality of Neisse; 6 miles E. of Neisse.

VOLCONDA, a town of Hindoostan, in the Carnatic; 95 miles S. of Arcot. N. lat. 11° 10′. E. long. 79° 10′.

VOLCZINCY, a town of European Turkey, in Macedonia; 25 miles W. of Orhei.

VOLENGO, a town of Italy; 23 miles W. of Mantua.

VOLERIUS, in *Ancient Geography*, a river of Corsica, whose mouth was on the northern coast. Ptolemy.

VOLERY, a great bird-cage, so large that the birds have room to fly up and down in it.

VOLGA, in *Geography*, a river of Russia, sometimes called by ancient writers *Rha*, and sometimes *Araxis*, is denominated by the Tartars *Idel*, *Adal*, or *Edel*, denoting plenty, and by the Moravians is still called *Rhau*. It is formed by two streams, one issuing from lake Seliger, in the government of Tver; the other from a smaller lake, eight miles from lake Seliger, which unite together, N. lat. 56° 40′. E. long. 51° 20′. Its waters issue from several lakes in the Valday frontier mountains. After their union, the river then takes a south-east course to Zobtzov; it then changes to north-east, passes Staritza, Tver, and Mologa; near which last place it changes its course to south-east, passes Jaroslavl, or Yaroslaf, Kostroma, Penza, and Kazan; after which its course is more south, passing by Spask, Simbirsk, Samara, &c. At Samara it inclines a little to the west, passing by Sizran, Chvalinsk, Volsk, Kurdium, Saratof, Kamlischin, Tzaritzin, &c.; at Tzaritzin it takes its course south-east, and passing by Tchernoiyar, and a number of other towns, forts, &c. in the governments of Tver, Yaroslaf, Kostroma, Nishney-Novgorod, Kazan, Simbirsk, Saratof, and Caucasus; it enters the Caspian sea at Astrachan, by several large mouths, two only of which are navigable for vessels of 150 tons. It is said to distribute itself into 70 branches, and to form a multitude of islands before its discharge into the Caspian. This is supposed to be the largest river in Europe, and in its course of 4000 versts, is joined by many other rivers; a canal is made from it to the Neva, which opens a navigable communication between the Caspian sea and the Baltic.

The Volga pursues its course through many fertile regions, and in the inferior part of it, passes by beautiful forests of oak. It very much overflows in the spring, and is then navigable in certain parts, which at other times are not navigable. Its chief navigation commences at Tver. It has no cataracts, nor other dangerous places; and it is said to become shallower from time to time, so as to afford reason for apprehending that it will cease to be navigable for vessels of any tolerable size. It abounds with fish, particularly sterlet, sturgeon, &c. The principal rivers which join it in its course are the *Kamma* and the *Okka*; which see respectively.

The Volga teems with a vast variety of fish, which not only supplies the parts adjacent, but the greater part of the empire, with the several sorts of sturgeons, with kaviar, and with an incredible number of different kinds of smaller fish. This store of wealth, which no other river in Europe possesses in an equal degree, induces the countrymen about the Volga to neglect agriculture, and to devote themselves to the fishery. Among the fish peculiar to the Volga, which seldom or never come into the collateral rivers, are the beluga, the sturgeon, the sterlet, the sevruga, the salmon, and white salmon. But of all the fish of the Volga, the several kinds of sturgeons, and the white salmon (salmo nelma), are the best. The beluga is from 20 to 25 spans in length, and weighs between 30 and 45 poods. Sturgeons are from 5 to 8 spans long, and from 20 pounds to 2 poods in weight; the sevruga holds the middle station between the beluga and the sturgeon; the red salmon is observed here only in the two last months of the year, and then but seldom; the white salmon swim against the stream in great numbers, from the beginning of January to some time in July; both these are from 3 to 5 spans long, and at most weigh 30 pounds. The barbel is often larger and heavier, and the sturgeons the largest after the beluga. Of all the subordinate rivers that fall into the Volga, the Kamma is the wealthiest in fish, and the fish of the Kamma are held to be the best flavoured of all in Russia; at least its sturgeon, sterlet, and white salmon, are preferable to those of the Volga. Besides these three kinds, a principal fish of the Kamma is a small salmon, called in Russ Krasnaya reba, red or beautiful fish (salmo eriox, or salmo alpinus), commonly $1\frac{1}{2}$ or 2 arshines long. There is scarcely any place in the world where such a variety of contrivances and instruments are used for the capture of fish as on the Volga, and particularly in the confines of Astrachan. These inventions may be reduced to three, one comprising the fish-weirs, or utschiugs, the second the angle, and the third the net. The utschiugs are various; but the sort most in use is that called Saboika. In the lower regions of the Volga, a fish-trap called gorodba is generally employed;

ployed; conſiſting of a weir carried acroſs the ſtream, and provided with ſeveral chambers, in which the fiſh are caught. The utſchiugs are generally conſtructed only in the territory of Aſtrachan, where the fiſhery on the Volga is a very important object of induſtry and traffic. The Tartarian word utſchiug properly ſignifies that kind of dam called Saboika; but at preſent it implies a whole fiſhing ſtation, uſually much larger than a vataga. (See Fishery and Caspian *Sea*.) Every utſchiug, beſides a number of buildings appropriate to it, has alſo a church and dwelling-houſe, for the labourers and their families. Since the year 1763, theſe utſchiugs have been granted to the merchants of Aſtrachan, in conſideration of a ſmall tribute; and the revenues are managed by what is called the fiſh-comptoir, the directors and members of which are elected from the body of Aſtrachan burghers. The profits, after deducting the very moderate tribute to the crown, muſt be divided in equal portions among the merchants; but by ſeveral reports it appears, that the fiſh-comptoir are ſo arrogant and arbitrary in their proceedings, that the generous abandonment of her prerogative by the late empreſs, who intended that the benefit ſhould extend over the whole, is only advantageous to certain privileged perſons, who enrich themſelves at the common expence. Beſides the actual inhabitants of Aſtrachan, who are employed in the fiſhery, every ſpring about 10,000 fiſhing-canoes come thither, having in each at leaſt two people, ſo that the number of ſtrangers who follow this trade at Aſtrachan far exceeds 20,000. Tooke's Ruſſia, vol. iii.

VOLGAIC Cossacks. See Cossacks.

VOLGANSK, a town of Ruſſia, in the government of Charkov, on the Donetz; 40 miles N.E. of Charkov.

VOLGIVOD, a river of Ruſſia, which riſes near Bachmut, in the government of Ekaterinoſlav, and runs into the Dnieper, 12 miles above Ekaterinoſlav.

VOLHYNIA, a palatinate of Ruſſian Poland, bounded on the north by the palatinate of Brzeſc, on the eaſt by Kiev, on the ſouth by the palatinate of Kaminiec, and on the weſt by the palatinates of Chelm and Belcz; about 180 miles in length, and from 80 to 120 in breadth. This country is ſo fertile, as to ſupply the inhabitants with a large ſurplus of grain; roſemary, aſparagus, &c. grow wild in the woods, and can ſcarcely be diſtinguiſhed from thoſe cultivated in the gardens. Volhynia was annexed to Poland in a diet held at Lublin in 1659. The Tartars, beſides a great booty, carried off 30,000 perſons out of this country, to be ſold as ſlaves, in the year 1618. It is now added to Ruſſia.

VOLI, in *Ancient Geography*, a people of Africa, in Mauritania Tingitana. Ptol.

VOLIBA, a town of Great Britain, aſſigned by Ptolemy to the Damnonii, or Dunmonii. It is placed by Camden and Baxter at Grampound; but Horſley thinks it was ſituated at Leſtwithiel.

VOLISSO, in *Geography*, a ſea-port town on the weſt coaſt of the iſland of Scio, ſaid to take its name from Beliſarius, called there "Veliſarius," who built the caſtle. It is ſituated at the ſide of a hill, about two miles from the ſea. It has a large bay, but no harbour. N. lat. 38° 27′. E. long. 25° 56′.

VOLITION, the act of willing. See Will.

VOLITIVE Thinking. See Thinking.

VOLKAMERIA, in *Botany*, was dedicated by Linnæus to the memory of Dr. John George Volckamer, a diſtinguiſhed phyſician, and profeſſor of medicine, at Nuremberg, who was born May 7th, 1662, and died June 8th, 1744. He publiſhed, in 1700, a very rich deſcriptive catalogue, in quarto, with many good plates, of the native as well as cultivated plants known in that neighbourhood, with the title of *Flora Noribergenſis*. He was the botanical correſpondent of Tournefort, Boerhaave, Sherard, Triumfetti, Commelin, and other eminent men of his time, and has been recently commemorated by his countrymen the Panzers, in an academical diſſertation, printed at Nuremberg in 1802.—Linn. Gen. 325. Schreb. 425. Willd. Sp. Pl. v. 3. 383. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 62. Juſſ. 107. Lamarck Illuſtr. t. 544. Gærtn. t. 56. (Duglaſſia; Reliq. Houſt. t. 13.)—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Vitices*, Juſſ. Gen. *Verbenaceæ*, Juſſ. in Ann. du Muſ. v. 7. 63. Brown Prodr. 510.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, turbinate, with five, nearly equal, acute ſegments. *Cor.* of one petal, ringent. Tube cylindrical, twice the length of the calyx. Limb flat, in five deep, nearly equal, reflexed ſegments, all nearly turned one way, and moſt widely ſeparated at the upper ſide. *Stam.* Filaments four, thread-ſhaped, very long, at the gaping ſide of the corolla; anthers ſimple. *Piſt.* Germen ſuperior, quadrangular; ſtyle thread-ſhaped, nearly the length of the ſtamens; ſtigma cloven, one ſegment acute, more conſpicuous than the other. *Peric.* Berry roundiſh, of two cells. *Seeds.* Nuts ſolitary, furrowed, each of two cells, with two kernels.

Eſſ. Ch. Calyx five-cleft. Corolla with a cylindrical tube, and deeply five-cleft limb, rather turned to one ſide. Stamens prominent, aſcending. Berry with two bilocular ſeeds.

Obſ. This genus ought probably, as Mr. Brown obſerves, to be ſunk in Clerodendrum, (ſee that article,) to which he has in Ait. Hort. Kew. removed all our garden ſpecies, except one, not without a juſt expreſſion of doubt reſpecting that alſo. The only pretended diſtinctions are, 1ſt, the ſegments of the corolla being turned one way, not equally ſpreading; and, 2d, the *Berry* having two ſeeds, each with two cells, inſtead of four ſeeds, each of one cell. The ſpecies we are about to deſcribe, however, having this character in the fruit at leaſt, and being the original *Volkameria*, may as well be retained as ſuch. Several of the others, popularly placed along with it, we have long ago found to have the characters of *Clerodendrum* altogether.

1. V. *aculeata*. Prickly Volkameria. Linn. Sp. Pl. 889. Willd. n. 1. Ait. n. 1. Jacq. Amer. 185. t. 117. (Clerodendrum n. 1; Browne Jam. 262. t. 30, not t. 20. f. 2. Liguſtrum aculeatum, fructu teſticulato; Plum. Ic. 156. t. 164. f. 2, not f. 1.)—Native of the Weſt Indies. Browne ſpeaks of it as one of the moſt common plants in the low lands of Jamaica, in a dry gravelly ſoil. Miller cultivated this ſhrub before the year 1739. Mr. Aiton ſays it flowers in the ſtove from Auguſt to October. The buſhy *ſtem* is five or ſix feet high, with round rather warty branches; the ultimate ones often whorled; and all beſet with ſhort ſharp prickles, originating in the permanent baſes of laſt year's footſtalks. *Leaves* oppoſite, ſtalked, lanceolate, bluntiſh, entire, an inch and a half or two inches long, nearly ſmooth; paler and minutely dotted beneath. *Stalks* axillary, three-flowered, a little downy. *Corolla* cream-coloured, with purple *ſtamens*. Willdenow has three errors of the preſs among the ſynonyms of this ſpecies, all copied from Linnæus, in the references to three common books, which he ought ſurely to have examined.

Some ſpecies referred to *Clerodendrum*, particularly *V. inermis* of Linnæus; as alſo *V. liguſtrina* of Willdenow; ſo nearly agree in habit with the above plant, that we cannot but miſtruſt any generic diſtinction which ſeparates them.

Volka-

Volkameria, in *Gardening*, furnishes plants of the exotic tree kind, among which the species cultivated are, the prickly volkameria (V. aculeata); and the ovate-leaved smooth volkameria (V. inermis).

The first is a rather tall spiny shrubby plant.

And the second sort has much the same appearance, but more white, and without spines.

Method of Culture.—These plants are increased by cuttings, which should be planted in pots filled with light good mould in the summer season, plunging them in a moderate hot-bed, covering them close with hand-glasses. When they are well rooted, they should be removed into separate small pots, replunging them in the hot-bed till they are fresh rooted; then gradually inure them to the open air in warm weather, continuing them in warm sheltered situations in the open air till the approach of frosts, when they must be taken into the house, where there is a moderate heat. They will not succeed in a common green-house.

They afford ornament among other more hardy stove-plants in pots.

VOLKENMARCK, or *Volkel Markt*, in *Geography*, a town of the duchy of Carinthia, on the north side of the Drave; 12 miles E. of Clagenfurt. N. lat. 46° 41′. E. long. 12° 20′.

VOLKERODE, a town of Germany, in the principality of Gotha; 20 miles N. of Gotha.

VOLKMARSEN, or Volmarsheim, a town of the duchy of Westphalia; 18 miles S.E of Paderborn. N. lat. 51° 23′. E. long. 9° 8′.

VOLL, a town of Norway, in the province of Aggerhuus, on the Glomme; 50 miles N.E. of Christiania.

VOLLENAY, a town of France, in the department of the Côte d'Or; 3 miles S.W. of Beaune.

VOLLENHOVEN, a town of Holland, and capital of a district, in the department of Overissel, situated near the Zuyder See. It is not large, but carries on a considerable trade. N. lat. 52° 44′. E. long. 5° 41′.

VOLLEY, a military salute, made by discharging a great number of fire-arms at the same time.

VOLLORE, in *Geography*, a town of France, in the department of the Puy de Dôme; 5 miles S.S.E. of Thiers.

VOLMAR, a town of Russia, in the government of Riga; 56 miles N.N.E. of Riga. N. lat. 57° 36′. E. long. 25° 14′.

VOLME, a river which rises about eight miles south of Lunschede, in the county of Mark, and joins the Roer, 4 miles S.W. of Schwiert.

VOLMER, a town of the principality of Culmbach; 3 miles S.E. of Berneck.

VOLMESTEIN, a town of Germany, in the county of Mark; 8 miles S.W. of Schwiert.

VOLMUNSTER, a town of France, in the department of the Moselle; 9 miles E. of Sarguemine.

VOLO, a sea-port town of European Turkey, in Thessaly, situated in a gulf, to which it gives name; 38 miles N.W. of Larissa. N. lat. 39° 28′. E. long. 23° 12′.

Volo, in *Antiquity*, a name which the Romans gave the slaves who, in the second Punic war, offered themselves to serve in the army, upon a want of a sufficient number of citizens.

The name *volo, volones*, they are said to have had from their offering themselves voluntarily. Festus says, it was after the battle of Cannæ that this happened. Macrobius, Sat. lib. i. cap. 2. places it before that battle.

Capitolinus tells us, that Marcus Aurelius formed troops, or legions, of slaves, which he called *voluntarii;* and that the like forces, in the second Punic war, had been called *volones*. But before M. Aurelius, Augustus had given the name *voluntarii* to forces which he had raised out of *liberti*, or freedmen; as we are assured by Macrobius, Sat. lib. i. cap. 2.

The *volones* were afterwards called *evocati*.

VOLOGDA, in *Geography*, a city of Russia, and capital of a government, on the river Suchona, near lake Kubenskoe, the see of an archbishop. This city contains about 1700 houses, and a great many churches. The principal trade is in hemp, matting, Russia leather, and tallow; 320 miles S. of Archangel. N. lat. 59° 10′. E. long. 40° 14′.

VOLOGESIA, a town of the Arabian Irak, and pachalic of Bagdat, built by Vologusa, one of the Parthian kings, contemporary with Nero and Vespasian, and mentioned by the ancient geographers as an inconsiderable place; but since the death of Hossein, the son of Ali, by Fatima, the daughter of the prophet, who was slain near it, and is here interred, it has increased in magnitude, and become more famous from the numerous bodies of pilgrims of the sect of Ali, who continually flock to it from all quarters, but in particular from Persia, to pay their devotions at the shrine. It is now large and populous, and called "Kerbela," or "Meshed-Hossein," situated 7 fursungs N.W. of Hilleh, the scite of ancient Babylon, at the extremity of a very noble canal drawn from the Euphrates. The environs of the town and borders of the canal are shaded by extensive plantations of palm-trees; and the walks, which are upwards of two miles in circumference, have lately been repaired, to secure the riches of the holy city against the predatory incursions of the Wahabees, by whom it was plundered some years ago. Kerbela has five gates, a well-supplied bazaar, and seven khans or caravanseras; but the chief, and, indeed, only ornaments of the city are the tomb of Hossein, which is adorned with a lofty cupola, gilded by Nadir Shah, and a noble mosque, consecrated to the memory of Abbas, the half-brother of the Imam. Although Meshed-Hossein is subject to the Turks, the inhabitants are for the most part Persians. The canal of Kerbela, or Nahr Sares, though it now bears the name of Hosseini, is more ancient than the days of Alexander, and is supposed at one time to have been connected with Bahr Wijiff. The modern town of Hilleh stands on the banks of the Euphrates, in N. lat. 32° 25′, and about 54 miles from Bagdat; covering a very small portion of the space occupied by the ancient capital of Assyria. See Babylon. Kinneir's Geog. Mem. of the Persian Empire.

VOLOGINA, a town of Russia, in the government of Irkutsk; 40 miles S.W. of Kirensk.

VOLOGODSKOI, a government of Russia, which includes the province of Ustrug; bounded on the north by the government of Archangel, on the east by the government of Tobolsk, on the south by the governments of Perm, Viatka, Kostroma, and Jaroslavl or Yaroslaf, and on the west by the governments of Olonetz and Novgorod; rather more than 600 miles in length, and about 240 in breadth. N. lat. 58° 30′ to 65° 20′. E. long. 39° to 59°.

VOLOGZANOVA, a town of Russia, in the government of Irkutsk; 18 miles N. of Ilimsk.

VOLONE, in *Ancient Geography*, a town of Italy, in Samnium.

Volone, in *Geography*, a town of France, in the department of the Lower Alps; 6 miles S.S.E. of Sisteron.

VOLOUSKA, a town of Istria; 15 miles N. of Laurana.

VOLPI, Gianantonio, in *Biography*, an elegant Latin poet, was descended from a noble family, and born at Como in 1514. Having studied jurisprudence in the university of Pavia,

Pavia, and pursued it with reputation at his native place; with a view to preferment, he visited Rome; but disappointed in his expectations, he returned to Como, and succeeded Bernardine della Croce, bishop of the church in 1559, the offices of which station he assiduously discharged for 30 years, until his death in 1588. His poems were collected, and published at Padua in 1725. They have been much praised for their elegance, and in the satires he is said to have happily imitated the style of Horace. Gen. Biog.

VOLPIANO, in *Geography*, a town of France, in the department of the Po; 9 miles N.N.E. of Turin.

VOLSAS Sinus, in *Ancient Geography*, a bay mentioned by Ptolemy, situated on the northern side of Great Britain: it is Loch-bay, in Rossshire.

VOLSBACH, in *Geography*, a town of the bishopric of Bamberg; 3 miles N.E. of Weischenfeld.

VOLSCI, or Volci, in *Ancient Geography*, a people of Italy, in Latium. They were descended from the ancient Osci: they had among them Coriolanus in the year 264; and in the year 310 they submitted to the Romans. Their territory lay from the sea of Antium as far as the source of the Liris, and beyond it. The extent of their country induced Mela to distinguish it from Latium, from which it was actually separated.

VOLSINENSIS or Vulsinensis *Lacus*, a lake of Italy, in Etruria, according to Pliny. He speaks vaguely and unphilosophically of two floating islands, the form of which was occasionally changed by the winds into triangular and round. Upon it, however, was one island, called the isle of S. Giacomo, to which the princess Amalasouth, queen of the Goths, was exiled by Theodotus, who in a few days caused her to be strangled, A.D. 534.

VOLSK, in *Geography*, a town of Russia, in the government of Saratov, on the Volga; 76 miles N.E. of Saratov. N. lat. 52° 15′. E. long. 47° 44′.

VOLTA, a town of Asiatic Turkey, on the south coast of Natolia. N. lat. 36° 46′. E. long. 27° 16′.—Also, a town of Italy, in the department of the Mincio; 10 miles N. of Mantua.

Volta, or *Rio Volta*, a river of Africa, which separates the Gold Coast from the Slave Coast, and runs into the Atlantic, N. lat. 5° 50′. W. long. 45′.

Volta, in the *Italian Music*, shews that the part is to be repeated one, two, or more times, according to the numeral adjective joined with it: thus, *si replica una volta*, intimates to play that part once over again.

Volta is also a sort of dance of Italian origin, in which the man turns the woman several times, and then assists her to make a leap or jump. It is a species of galliard.

VOLTAGGIO, or Ottagio, in *Geography*, a town of the Ligurian republic; 15 miles N. of Genoa.

VOLTAIRE, Marie François Arouet de, in *Biography*, was born at Chatenay, near Paris, in the year 1694, and in his earliest youth indicated a partial fondness for verse, which was cherished by the recital of La Fontaine's fables. He was also constrained to commit to memory a poem, entitled "La Moïsade," and thus he is said to have imbibed a prepossession against the Mosaic history. In pursuing his literary education at the Jesuits' college of Louis-le-Grand, he had for his preceptor father Porée; and at the age of 12, distinguished himself by compositions above his years. The celebrated Ninon de l'Enclos, to whom he was presented, left him a legacy of 2000 livres, which he destined for a juvenile library. Dissatisfied with law, for the profession of which his father designed him, he devoted his whole attention to poetry, which was rendered invincible by a society of wits and Epicureans, into which he was admitted. His father made an attempt to divert him from his favourite pursuit, by sending him as a page in the suite of the marquis de Chateauneuf, ambassador from France to Holland; but falling in love with the daughter of Mad. du Noyer, a refugee, he was sent back to Paris, and excluded from his father's house. In this pitiable situation he was taken under the protection of M. de Caumartin, his father's friend; and at his country-house he had the advantage of conversing with the elder Caumartin, who inspired him with his own enthusiastic admiration of Henry IV. and Sully. He still indulged his disposition for writing lampoons; and for one of these, aimed at the government, he was imprisoned for a year in the Bastille. At this time he had composed his tragedy of "Œdipe," which was brought on the stage in 1718, and much applauded. The regent was also highly pleased with it, and granted him permission to return to Paris, after his release from the Bastille. His father, much interested in his favour by attending at one of the representations of his tragedy, was reconciled to him, and gave up all thoughts of making him a lawyer. At Brussels, which he visited in 1722, he became acquainted with the poet Rousseau; but in consequence of this interview, they became enemies for life. On his return, his "Mariamne" was exhibited, and did not succeed. In 1726 he was again lodged in the Bastille, in consequence of a quarrel with the chevalier de Rohan; and obtained liberation, after a confinement of six months, upon condition of leaving the kingdom. England was the country of his choice, and he brought with him his poem of the "Henriade." It was printed in London by subscription, patronized by king George I. and Caroline princess of Wales, and yielded a profit which laid the foundation of his fortune. His manners, however, did not suit those of England, and his conversation was unsufferably licentious. Having obtained permission to return to France in 1728, he put his money into a lottery, and engaged in other lucrative speculations, and thus amassed a large capital, which he augmented by his economy. His tragedy of "Brutus," brought on the stage in 1730, was not very popular; and as his dramatic reputation was ambiguous, he was advised by Fontenelle and La Motte to abandon this species of composition, alleging that it was not adapted to his genius. His reply was the production of his "Zaïre," which was regarded as the most affecting piece on the French stage, after the "Phedre" of Racine. On account of his "Lettres Philosophiques," he was considered as an avowed enemy to revelation and ecclesiastical authority; and the parliament of Paris issued a decree, which ordered his work to be committed to the flames, and his person to be arrested. Upon this he quitted the capital, and retired to Cyrei, near Vassi, in Champagne, the seat of the marquis du Chatelet, where they employed themselves in making experiments, and where Voltaire wrote his "Elements of the Newtonian Philosophy." He also continued to write tragedies, so that his "Alzire" appeared in 1736, and his "Mahomet" in 1741; but the latter, charged with being an attack upon religion, was withdrawn from the stage. His "Merope," exhibited in 1743, was received with the greatest applause. Before this time he had made his peace at court by a political service, which it is not necessary for us to relate; and he farther ingratiated himself with the royal family by his piece for the festivities on the marriage of the Dauphin, entitled "La Princesse de Navarre." Received at court, he became gentleman of the chamber in ordinary, and historiographer of France; and, under the latter character, drew up his history of the war of 1741, which then subsisted. He also engaged in other courtly offices, and wrote the manifesto of the French court in favour of the Pretender, on his expedition to Scotland. In 1746 he was admitted into the French

French academy. In consequence of urgent invitations on the part of the king of Prussia, and assurance of a pension of 22,000 livres, with other benefits, he arrived at Potsdam in June, 1750; and was received by the king with the most flattering tokens of respect. Here it was his practice to spend two hours in the day with his majesty, during which he employed himself in correcting his works; and the rest of his time was at his own disposal. His tranquillity, however, was soon interrupted, on occasion of a dispute between Maupertuis and Koenig; for though the king desired him not to interfere, he took part against Maupertuis, and Frederic sent him his dismission. During his absence on a visit to the duchess of Saxe-Gotha, Maupertuis, as he says, used his influence to lower him in the king's estimation; and, therefore, instead of returning to Berlin, he proceeded towards France; but at Frankfort he was arrested by the king's order, and obliged to restore his poems, with which he had been intrusted for correction, together with his key, cross, and the brevet for his pension. It was now his wish to reside at Paris; but he could not obtain permission for this purpose, as he had published a very indecent and licentious poem, "La Pucelle d'Orleans," which had raised a violent outcry against him; and, therefore, after a year's stay at Colmar, he purchased a country-house near Geneva; and having gratified his petulant disposition by interfering in the political disputes of this place, he thought proper to remove, and bought an estate at Ferney, in the Pays de Gex. Here he lived, as one of his biographers has said, "like a petty prince in his own territory;"—"improving his own village by encouraging colonists, and introducing manufactures, which through his influence obtained a sale in many countries of the continent."—"A declared enemy to tyranny and oppression of every kind, he undertook the protection of several sufferers from injustice, among whom were the family of Calas, a noted victim of religious bigotry. He made the enormity of these abuses of power known throughout Europe, and set himself up as a kind of general censor, to whose tribunal the highest ranks were amenable." All his motives his biographer does not attempt to justify. He likewise poured forth from this retreat a variety of works, which were sought after and generally read, directing the sentiments and influencing the conduct of many who perused them, whether always to their own honour and advantage we leave others who are acquainted with them to determine. In general, his extended sway over the opinions of the civilized part of mankind, says the biographer of whose observations we avail ourselves in the compilation of this article, "was directed to the subversion of both civil and ecclesiastical tyranny; but his attacks on the latter included hostilities against religion in general, at least of the revealed class: and, whilst he admitted natural religion, he destroyed its moral efficacy." In his retreat he was visited by the most distinguished persons who came near his abode, and he corresponded with some of the chief sovereigns of Europe. Nevertheless he was not happy. Impatient and restless in his disposition, and irritable in his temper, he was self-tormented. In advanced life he wished again to emerge from obscurity; and in February, 1778, he visited Paris, where he had many admirers, and where he was regarded also with aversion and alarm. Here his vanity and love of admiration and praise must be fully gratified, by the manner in which he was received at the theatre, after the exhibition of his "Irene," which he had brought with him. As soon as he was seated in his box, after having received repeated plaudits in his way to it, an actor placed a crown on his head. When the play was concluded, the drawing up of the curtain displayed all the actors and actresses surrounding a bust of Voltaire, and by turns covering it with garlands of laurel; and Mad. Vestris, advancing to the front of the stage, pronounced some verses to his praise, composed on the spot by a nobleman, amid the shouts of the audience. This reception produced effects on his feeble frame, which probably hastened its dissolution. Of this Voltaire himself seems to have been apprised, when he said in a tone of deep melancholy, "I am come to Paris to find glory and a tomb." Unable to sleep, it is thought that he accelerated his death by taking too large a dose of opium. When he was thought to be near his last moments, the marquis de Villette, with whom he resided, sent for the rector of St. Sulpice to administer the last offices which are thought essential to the safety of a Catholic Christian. What passed between Voltaire and the rector on this occasion has been differently stated; but it is certain that he died, without the last sacraments, on the 30th of May, 1778, in the 85th year of his age. It is said that the archbishop of Paris absolutely refused to allow him Christian burial, and that his body was secretly conveyed for interment to Sellieres, an abbey of Bernardines, between Nogent and Troyes. It was thence brought, by a decree of the national assembly in 1791, to be reposited in St. Genevieve's at Paris.

"The physiognomy of Voltaire," says his biographer, "was indicative of his disposition. It is said to have partaken of the eagle and the monkey; and to the fire and rapidity of the former animal, he united the mischievous and malicious propensities of the latter. With strong perceptions of moral excellence and elevation, he was little and mean in conduct, a victim to petty passions and caprices; never at rest either in mind or body, never tranquil or sedate. If he was a philosopher, it was in his opinions, not in his actions. He had been accustomed from his youth to pay as much homage to rank and wealth as his vanity would permit; his tastes of life were vitiated, and his manners corrupted: he could not, therefore, be a consistent friend to virtue and liberty, though he might occasionally be captivated with their charms, and even zealous in their support. He was habitually avaricious, though he performed some generous acts, which, however, he took care to make known. He was too selfish to inspire love, and too capricious to merit esteem. He had numerous admirers, but probably not one friend."

As a poetical writer, he was distinguished by his "Henriade," which was considered as the principal epic poem in the French language, and by his tragedies, which are said to have more variety of style and subject than those of Corneille and Racine; but in comedy and lyric composition he was not equally successful. The morality of his moral epistles, which are excellent in their manner, is liable to many objections. As a prose writer, Voltaire has been commended for that kind of middle style, which is pure, unaffected, lively, precise, and always in good taste. In the department of history, his principal works are the "Essai sur Histoire generale," and the "Siècles de Louis XIV. et de Louis XV." His "Histoire de Charles XII." is a model of royal biography. Of his witty writings, which are very numerous, we may observe in general, that they are not only depreciated in real value, but rendered pernicious in their tendency and effect, by his frequently recurring attacks and sarcasms, levelled against revealed religion: nor shall we be thought deficient in candour if we add, that, whatever instruction or amusement his productions of the latter class afford, they have done greater injury, in a moral and religious view of them, particularly among persons of little reflection, than those of any other author. All the works of Voltaire amount to 30 vols. 4to. of the Genevan edition, and 71 vols. 8vo. in the more complete edition of Basil. Gen. Biog. by Aikin.

The universality of Voltaire's genius extended to music, though no musician. And in spite of his partiality to his own country, he did the writings of Metastasio, and the Italian opera, more justice than any of his countrymen. And though he gained less applause by his lyric poetry than his other poetical composition, he produced several pieces for music, and frequently made admirable reflections on the lyric theatre.

Voltaire has never planted his sarcastic artillery against Italian music or singing. And though neither a connoisseur nor passionately fond of music, he seems instinctively to have felt a superiority in the music of Italy to that of France; and has been always just to the writings of Metastasio. For though a defender of Quinault against the injustice of Boileau, he has never set him up as a writer for music superior to the imperial laureat. The truth is, that Voltaire, with all the black spots in his character, had a natural good taste when his judgment was not warped by envy, or his passions inflamed by the attacks of his enemies. He early saw and celebrated the science of Newton and genius of Shakspeare. And it was not till the latter had been more noticed, and the translation of his works more patronized than his own, that, in self-defence, he abused them.

VOLTAISM. That branch of electrical science which has its source in the chemical action between metals and different liquids, and in the proofs which establish its identity with common electricity, the world owe principally to discoveries made by signor Volta. Its remarkable influence upon animals, which first brought it into notice, was first observed by Galvani. Hence it was first called Galvanism and afterwards Voltaism. We should have treated this subject wholly under GALVANISM, which was then more than half completed, but the latter was not finished in time to be then published. Hence the present article must rather be considered as a continuation of Galvanism, than a distinct treatise.

Galvanism concludes with a list of the different galvanic combinations, which will be terminated in this article, and the rest will be treated in succession. We have also given some account of all such facts as have transpired since the time of the publication of the first part.

TABLE shewing the relative quantity of bubbles upon the negative wire, by immersing a compound arc, of zinc and platina, into different saline solutions at a boiling heat, and at the common temperature.

Solution.	Effect. Hot.	Effect. Cold.	Remarks.
Muriate of ammonia	6	3	
Muriate of soda -	2	1	
Super-tartrate of potash	4	0	In this and other cases, where the cypher is placed, it does not mean that no effect was produced, but that no bubbles could be seen.
Nitrate of potash -	½	0	In this experiment two combined arcs were used which just produced a sensible effect.
Phosphate of soda			
Alum - -	4	2	
Sulphate of potash -	0	0	
Sulphate of soda -	0	0	
Sulphate of magnesia -	0	0	In the three last two combined arcs were tried, but no bubbles appeared.

The two preceding tables will give some idea of the relative power of different combinations of metals, and of the comparative action of different fluids.

The most powerful of the metallic combinations will be seen to be zinc with platina, gold, and silver; but zinc with copper is so little inferior, that in point of economy it will always be preferred.

Zinc with iron is, however, so near to zinc with copper, that iron might be used to great advantage where cheapness is desirable.

Zinc and copper are, in the present state of Galvanism, generally employed for the construction of galvanic batteries. In the trough invented by Cruickshank, the zinc and copper plates were soldered together in pairs, so as to form so many compound plates. These plates are cemented into a wooden box, which is lined with the same cement, at such a distance from each other, as to divide the trough into distinct cells about half wide. The order of the plates should be such that all the zinc plates face one way, and the copper ones the contrary.

A great improvement has been made upon the trough of Cruickshank, by forming the cells in the trough with plates of glass. The plates of metal are soldered together by their edges, and bent at the joining, till the opposite sides become parallel, and separate from each other about half an inch. Each of these compound arcs is so placed in the trough with glass plates, that the zinc plate of each arc may be on one side of the glass, and the copper on the other, and in such order, that the zinc plate of one arc, and the copper of another, may be in each of the cells. A second improvement has been made upon this trough. Instead of a wooden trough, divided into cells with glass plates, the whole trough is made of earthenware, each trough consisting of ten cells. All the plates are fitted to a piece of wood of the length of the trough, so that they can be taken out or put into the trough all together. When they are taken out, the fluid is suffered to remain in the trough, and the plates are suspended over it upon a gibbet attached to the frame in which the earthen trough is placed. An immense battery upon this construction, consisting of 2000 pairs of four-inch plates, has been lately made for the Royal Institution. The experiments made upon it were inconceivably brilliant. The spark was so intense as to strike through a space of some lines of air, and of such dazzling splendour as to resemble the sun. Many substances were fused by the heat it produced, which had not been fused before, among which were the metal called fredium, and the earths zircon and alumine. Charcoal was made to evaporate, and plumbago to fuse in vacuo. A large electrical battery was charged by instant contact.

Since the trial of this battery, one of immense surface has been constructed by J. G. Children, esq. It consisted of twenty pairs of plates of copper and zinc, each plate being six feet square, the whole exhibiting a zinc and copper surface equal to 720 square feet. Each of the pairs of plates was united at the top by strips of lead bent into an arch, and so as to allow the plates to be exactly parallel to each other. The cells were distinct and made of wood; each pair of plates entered two cells, having the wooden division between them. The plates were all suspended from a beam above, and counterpoised to admit of their being easily let down into the liquid in the cells. The liquid consisted of water with one-sixtieth of a mixture of the sulphuric and nitric acids, which was afterwards gradually increased to one-thirtieth. Leaden pipes were conveyed from the ends of the battery to an adjoining shade out of doors, where the experiments were made.

This battery, as a source of heat, surpassed any thing ever

ever before heard of. It melted platinum with the greateſt facility. Triſhum, which had not been before melted, was fuſed into a globule. Charcoal was kept at a white heat in chlorine gas and phoſgene gas, without any change being produced in the gas. It ignited ſix feet of platina wire. It was obſerved, that when the wire was leſs than a certain diameter, a leſs length was ignited. A view of one of the before mentioned troughs is ſhewn in *fig.* 1.

Since this plan is likely to become general, from its great advantage both in economy and convenience, we ſhall venture to ſuggeſt ſeveral improvements.

For making all the variety of galvanic experiments, it has always been a deſideratum to have a battery, the ſurface of which may be increaſed in any proportion, to a certain limit, without affecting the ſeries or number of combinations. This has not hitherto appeared practicable by any other means than that of uſing diſtinct batteries of different ſizes.

A battery on the plan above deſcribed, having looſe plates, will admit of the advantage here alluded to, without any other increaſe of expence than that of the additional plates which are meant to increaſe the ſurface at pleaſure.

The cells in the earthen trough ſhould be about an inch and a half from one dividing ſurface to the other, and capable of receiving plates of four inches ſquare. Each of the cells may occaſionally contain four plates, two of zinc and two of copper.

The form of the plates for this battery is repreſented in *fig.* 2. *Plate* I. having a wire ſtaple, *a b*, of the ſame metal with the plate. The ſtaples muſt be made accurately of the ſame ſize for all the plates. A piece of wood, *a b*, (*fig.* 3.) is made to paſs through all the ſtaples of the plates. This bearer, or ſuſpender, is divided into as many tranſverſe grooves as there are plates, of a depth capable of receiving one-half of the diameter of the wire ſtaple. In the ſame bearer are alſo two longitudinal grooves, A A, B B, about one-tenth of an inch wide and a quarter of an inch deep. A number of ſliding pieces of braſs, *a a*, are introduced into the latter grooves, equal to the number of combinations, one half of the pieces being in one groove, and the other half in the other. Theſe pieces of metal, after being placed in proper ſituations, are filed down with the tranſverſe grooves, leaving the metal above the wood, where the ſtaple of a plate is intended to touch the metal, and filing the metal away lower than the wood, where the ſtaple is not meant to be in contact.

After the plates are arranged upon the bearer, alternately copper and zinc, the pieces of ſliding metal are made to communicate with them, that the zinc plates of one cell may communicate with the copper of the ſucceeding cell, the zinc of the laſt with the copper of the next, and ſo on throughout the ſeries. The plates being all in their places and properly connected, a ſecond piece of wood, *c d*, (*fig.* 4.) is laid upon the bearer, with correſpondent grooves to fit the ſtaples. It is covered on the under ſide with woollen cloth, ſo that when it is ſcrewed to the bearer it ſerves to keep the plates ſecure, and at the ſame time preſerves the connecting parts from the fumes of the acid employed in the battery. A ſection of the bearer, ſtaples, &c. are ſeen in *fig.* 4. The whole of the apparatus complete is repreſented in *fig.* 5, as drawn out of the cell. *Fig.* 6. is an end view of the apparatus.

In this battery, the maximum of ſurface is when every cell contains two plates each of zinc and copper. When it is required to reduce the ſurface, nothing more is neceſſary than to take off the top part of the bearer, while the plates are reſting in the trough, and then drawing out the lower part. If the two end plates of each cell, one of copper and the other of zinc, be taken away throughout the whole, the bearer may be again introduced to its original ſituation. The battery will now conſiſt of the ſame ſeries and half the ſurface. If a mean quantity of ſurface be required, it is done by taking the end plates away from a part of the cells.

It appears, from an experiment detailed in Nicholſon's Journal, vol. xxvi. p. 72, that the copper ſurface may be increaſed to advantage above that of the zinc. The experiment is as follows: If an arc of copper and zinc be made to connect two glaſs cups containing dilute muriatic acid, the zinc part of the arc being in one cup and the copper in the other, and if the connection be made between the two cups, to compleat the circuit by an arc of copper wire, a quantity of bubbles will be evolved from the copper wire of the compound arc. If, however, inſtead of the copper wire the connection be made with a conical ſlip of copper, a very different effect will be obſerved, as the broad or pointed end of the ſlip may be next to the zinc wire. When the broad end is placed in the cup where the zinc wire is placed, a much greater quantity of bubbles appears upon the copper of the compound arc, than when the ſmall end is placed next to the zinc. Hence it would appear, that the copper ſurface ſhould be greater than that of the zinc. This may be very eaſily effected, by dividing the copper ſurface into ſmall grooves, the ſides of which make an angle of 60°, the ſurface will by this means be doubled. This figure might be given to the copper ſurface by means of a pair of fluted rollers. It will be obvious, that if the grooves are not very ſmall, the different parts of the copper ſurface will not be uniformly contiguous to the zinc ſurface, which is a matter of ſome importance.

Having deſcribed the moſt convenient and economical method of conſtructing a battery, we ſhall now conſider the means of exerting the galvanic energy ſo far as relates to the interpoſing fluid.

In the galvanic battery, there appear to be two ſources from which the electricity is obtained. The one is that which ariſes from the contact of the metals, and the other from the chemical action between the interpoſing fluid and the zinc ſurface. The firſt does not require even the preſence of moiſture, as is ſhewn in the electric column of De Luc. The ſecond is rendered greatly conſpicuous by introducing between the oppoſite ſurfaces any ſubſtance capable of oxydating and diſſolving the zinc.

Acids, as appears from the preceding table, are the greateſt promoters of the energy afforded by chemical action, becauſe they diſſolve the zinc after it has been oxydated by the oxygen of the water. This is more eſpecially the caſe with the ſulphuric and muriatic acids, becauſe theſe acids are not decompoſed by the zinc. The nitric acid produces a ſtill greater galvanic effect, becauſe the acid is decompoſed, and oxydates the zinc with greater facility than water. The water is alſo decompoſed when this acid is uſed. Zinc hydrogen is always evolved.

The action is always increaſed when the conducting power of the fluid is increaſed. Hence it would be proper to uſe ſome cheap ſaline ſolution with the acid, which will not be decompoſed by the ſame.

The ſaline ſolutions, alone, are very inferior to any of the acids. But from what has been obſerved, we may eaſily point out ſuch ſalts as are beſt fitted for the purpoſe. All the ſuper-ſalts, from their exceſs of acid, will anſwer this purpoſe; or ſuch ſalts as are decompoſed by zinc. All thoſe ſalts which act upon metals by forming triple ſalts, ſuch as muriate of ammonia and muriate of ſoda, are found to act very well in the galvanic battery.

It will be proper to obferve here, that the interpofed fluid does not afford a quantity of electricity proportionate to the rapidity of the oxydation, or at leaft the quantity of galvanic energy cannot be appreciated beyond a certain limit. If the quantity of the concentrated acid be much more than from $\frac{1}{20}$ to $\frac{1}{10}$ the weight of the water, the power of the battery will not be found to increafe but from another caufe, which we fhall hereafter explain; the power is much fooner exhaufted than when a fmaller dofe is ufed. The zinc is oxydated fo flowly by faline bodies, that they may be ufed in faturated folutions. Potafh, in a cauftic ftate, even when much diluted with water, might be ufed to great advantage. At the fame time that it fcarcely appears to oxydate the zinc, when a fingle pair of wires of copper and zinc are ufed, the copper wire affords as much hydrogen during the contact, as could be expected from the agency of an acid. It is, therefore, highly probable, that potafh or foda will be fubftituted for acids in galvanic experiments, as well for the fake of economy as from its being lefs offenfive to the operator. It poffeffes another advantage ftill greater, in not deftroying the zinc plates like acid folutions.

From what has been faid regarding the interpofed fluid, it will be eafy to infer that the greateft part of the galvanic energy, which is electricity excited by chemical action, depends upon the prefence of the water, and fome fubftance which can diffolve the zinc, and at the fame time give a greater conducting power to the water. The effect is not, as fir Humphrey Davy has fuppofed, produced by the oppofite electrical ftates of the elements of the compounds conftituting the fluid medium, fince the hypothefis is contradicted by experiment. If there wanted another experiment to decide, that the galvanic effect is as the chemical effect, the following would fuffice. Take two wine-glaffes, containing dilute muriatic acid, and connect them by an arc made of two wires, one of zinc and the other of platina, foldered or tied together, the zinc being in one glafs and the copper in the other. If the circuit be complicated between the glaffes by an arc of platina wire, no appearance of bubbles will be obferved upon the platina wire of the compound arc. If, however, a fmall quantity of nitric acid be poured into the glafs containing this wire, hydrogen gas will be immediately evolved from it, and at the fame time the other platina wire in the fame glafs will become oxydated. This effect is not caufed by the electrical agency of the nitric acid, which is decompofed; becaufe when copper is ufed inftead of platina, with the pure muriatic acid, the fame effect takes place. It appears, therefore, that the increafed effect would be attributed only to the oxydation of the wire of the homogeneous arc, in the glafs containing the negative wire of the compound arc.

In every galvanic procefs, from a fingle combination to an unlimited feries, no effect is obferved till the circuit is complete; and during this, a current of electricity is eftablifhed from the zinc furface of one combination to the copper of the fucceeding. While it is paffing through a metal, whatever be its length, it obeys the laws of electricity very ftrictly, but when it paffes through a humid conductor, it appears to poffefs rather anomalous properties. It is proper to obferve here, that conductors of Galvanifm are of two kinds; the one we fhall call dry conductors, and the other humid. The firft clafs comprifes all the metals, well burnt charcoal, plumbage, and the fulphurets of metals. Water appears to be effential to the fecond kind, holding in folution acids, alkalies, or neutral falts. Simple water has its conducting power increafed by the fmalleft quantity of any acid, alkali, or falt. When the conducting wires of a galvanic battery are made to terminate in a veffel of pure water the water will be obferved to be decompofed, the oxygen being given out at the pofitive wire, or that coming from the zinc fide of the battery, and the hydrogen from the negative or oppofite wire. If the fmalleft quantity of an acid, a falt, or an alkali, be added to the water, the rapidity of the decompofition will be increafed very confpicuoufly.

As it is of fome importance to know the relative conducting power of water, and its different compounds, the following apparatus has been contrived for this purpofe, reprefented in *fig.* 7. Let *e g* be a fmall cup of wood varnifhed, or, what is much better, glafs; and *z c* two wires of platina diftinctly inferted in the bottom of the cup, fo as to be water tight. A glafs tube, *o p*, filled with the fluid, is inverted in the cup to receive the gas which arifes from the wires *z c*, while the fluid defcends, and is contained in the cup. If the cup *e g* be made larger, and of an oval fhape, two glafs tubes may be inverted over each wire, and the gafes may be obtained feparately. *Fig.* 8. A B C D, is a frame fupporting one of the cups. The parts G and F are of glafs or varnifhed dry wood, cemented into the parts A B C D, which are of brafs, fo that the two fides H and I of the frame are detached. The apparatus, *fig.* 7. with four others fimilar, are to be placed in the frame, the wire *z* being inferted into one fide of the frame, and the other, *c*, refting upon the other fide. When the glafs tubes of each are filled with different fluids, the fide H is connected with one end of the battery, and that of I with the other. Since the galvanic current muft neceffarily take the beft conductor, the action will commence through that fluid having the greateft conducting power. If a thin bit of baked wood or glafs be put under the refting part *c*, in that where the action commenced, the current will be transferred to the next inferior conductor, and fo on to all the reft. By this means an accurate table, fhewing the relative conducting powers of fluids, may be eafily obtained.

Since the quantity of gas is the teft of the conducting power, fome allowance muft be made when the muriates are the fubject of experiment. Almoft all the oxygen gas difappears in converting the muriatic into oxymuriatic acid. In a fimilar way the hydrogen does not appear when certain metallic folutions are employed, fince it combines with the oxygen of the metallic oxyd, and the metal is reduced. When the battery is in full power, and of great extent, the relative conducting power of the fluids may be expreffed by the time required for the afcending gas to difplace the liquid in the glafs tube. In all thofe experiments where the elements of bodies are transferred to different fides, the transfer takes place through any of the moift conductors, but not through any of the dry ones. No transfer can therefore be made through folid bodies, except the body be permeable to moifture. Sir Humphrey Davy, in his experiments, made ufe of the fibrous afbeftus moiftened with water. Where the fluids are required to be ftrictly feparate, bladder anfwers very well as a feparating medium. Animal and vegetable fubftances, however, abound with fo many elements, that in nice experiments they would be objectionable. A veffel divided into a proper number of cells of earthenware, in the ftate of bifcuit, would be beft calculated for thefe experiments. This veffel fhould be made of pure filex and pure alumina. Should it ever become an object of manufacture to feparate acids and alkalies from neutral falts, a veffel of wood, with a feparation in the middle, of unglazed earthenware, would anfwer very well.

We fhall here mention fome curious facts connected with the interpofition of metals, in different conducting media.

When the wires, coming from the two ends of a galvanic battery,

battery, are brought into ſeparate veſſels containing any fluid which is a conductor. If a wire of platina, in the form of an arc, connect the two glaſſes together, that end of the connecting arc in the poſitive glaſs will afford hydrogen gas, while that in the negative glaſs will furniſh oxygen gas; or, if we take all the four ends of the wires in the circuit, the poſitive wire from the battery will give oxygen, and that oppoſite to it, in the ſame glaſs, hydrogen. In the other glaſs, the negative wire will afford hydrogen, and the oppoſite wire oxygen, ſo that the water appears to be decompoſed in each glaſs, ſince oxygen and hydrogen are furniſhed ſeparately by each glaſs. If a number of glaſſes be arranged ſimilarly, having connecting arcs of platina, and if the wires of the battery be introduced in the extreme glaſſes, all the ends of the wires will alternately furniſh oxygen and hydrogen. No theory yet brought forward will ſatisfactorily account for theſe phenomena. Sir Humphrey Davy would aſſert, that each of the wires from the battery induced an oppoſite ſtate of electricity in the wires oppoſed to them; and that in conſequence the one attracted oxygen and the other hydrogen. Another theoriſt might hold that the electricity, which enters the firſt glaſs from the poſitive ſide, decompoſes the water, and combining with the hydrogen, ſets the oxygen free. The electricity and the hydrogen paſs through the fluid to the oppoſite wire, when the electricity deſerts the hydrogen, and paſſing through the platina arc, decompoſes the water in the ſecond glaſs. The oxygen is again evolved, and the hydrogen carried to the next wire, and ſo on through the remainder of the glaſſes.

A very curious experiment of the above kind rather tends to confirm the latter, than the former hypotheſis. We, however, give theſe facts to the common ſtock, for the advantage of other labourers in this field of inquiry; ſtrongly convinced that every hypotheſis yet advanced falls very ſhort of explaining all the phenomena of Galvaniſm.

Let the wires of a galvanic battery be made to terminate in a flat-bottomed veſſel, containing pure water, about an inch and a half from each other; and if now another wire, of an inch in length, be laid longitudinally between them, but not to touch them, each end of the intermediate wire, if of gold or platina, will afford gas. That end oppoſite the negative wire will give oxygen, and the other end of the ſame will furniſh hydrogen; and if any number of bits of wire be placed between the principal wires, at the ſame time they do not touch each other, oxygen and hydrogen will be alternately furniſhed by the ends of the wires. When the principal wires are brought nearer together, and a platina wire placed tranſverſely between them, one ſide of the intermediate wire will furniſh oxygen, and the other hydrogen. This fact is put in a more ſtriking point of view, by placing a plate of platina in a veſſel of water edgeways, and bringing the wires of the battery oppoſite to each other, and perpendicular to the ſides of the plate. If the battery employed conſiſt of 50 plates three inches ſquare, a circular ſpot will be obſerved on each ſide the plate, oppoſite the wires. This appearance is cauſed by the evolution of gas from thoſe parts of the plate only.

It is ſingular, that in all the experiments where the connecting wire was immerſed in the water, if any ſubſtance, capable of increaſing the conducting power of the water, be very gradually added to it, the gaſes given out by the intermediate wire will diminiſh, till they entirely ceaſe to be produced. The wire which was tranſverſely placed ſooner ceaſed to afford gas, than when it was in a longitudinal poſition; and the effect ſooner ceaſed with the wire than with the plate; and in different plates, the continuance was as the ſize of the plate.

If the plate, however, be cut ſo as to divide the veſſel into two portions, and the edges ſo completely cemented to the ſides of the veſſel that no liquid communication exiſts between the two portions, each ſide of the plate will furniſh as much gas as the wires, whatever may be the conducting power of the fluid. If the power, which induces the plate or immerſed wires to give out gas, depended upon the induction of the oppoſite wires, why is it not as great before the fluid is divided as afterwards? and why is it the ſame when pure water is uſed, whether the intermediate wire be immerſed in the water, or is made to connect two portions of water together? Theſe are facts which, in the preſent ſtate of knowledge, do not admit of eaſy ſolution. They, however, ſhew us the neceſſity of having the cells of our galvanic batteries perfectly diſtinct from each other. It appears pretty clear, that that which conducts the oxygen or the hydrogen, or perhaps both, paſſes with greater facility through a good moiſt conductor than through a metal.

Decompoſition of Bodies in general.—The decompoſition of water and of metallic oxyds was known to Cruickſhank, the hiſtory of whoſe experiments we have already given; and in a very early ſtage of galvanic progreſs, it was obſerved that the alkali was ſeparated from muriate of ſoda in the galvanic battery. In ſubjecting muriate of ſoda to the galvanic power in a glaſs tube, it has alſo been obſerved that oxymuriatic acid was produced. The ſubject of the decompoſition of ſalts, however, has been clearly made out, and eſtabliſhed on true principles, by ſir Humphrey Davy, whoſe experiments have been detailed under GALVANISM. The chemical agency of bodies, ariſing from their relative electric ſtates, is no doubt the cauſe of the decompoſitions of ſalts, and of all other bodies to a certain extent; although there are many decompoſitions, particularly the metallic oxyds and water, which are to be attributed to ſome other cauſe much more active and expeditious. We ſhall here venture to draw a line of diſtinction between the decompoſition effected by the electrical intenſity ariſing from the contact of the bodies, and that produced by the electricity, and the hydrogen developed by the chemical agency of the oxydable metal, and the oxydating fluid.

If we take a ſingle combination, for inſtance, a zinc wire connected with a platina wire, the electrical intenſity ariſing from contact is ſo exceeding ſmall, that it could hardly be appreciated by the acid of the condenſer. If this combination be immerſed in water, no galvanic appearance takes place, however near the immerſed ends be brought to each other. If, however, we add to the water about one-tenth its weight of muriatic acid, an immenſe quantity of hydrogen immediately appears upon the platina wire, and continues to be evolved ſo long as the contact is formed, till the acid is expended. The electrical intenſity, however, is the ſame with the water as with the dilute acid; yet the quantity of hydrogen upon the platina wire, when the acid was uſed, which can be attributed only to galvaniſm of chemical action, is much more than could be obtained by the moſt powerful electric machine. It can readily be admitted, from experiments in which Dr. Wollaſton decompoſed water by the electric machine, and from the electric effects of Deluc's column, that ſome water would be decompoſed by the ſingle combination, independently of the chemical action; but the difference is ſo glaring as to produce the ſtrongeſt conviction, that the decompoſition of water and the tranſmiſſion of hydrogen are not dependent on the mere electric ſtates of the wires. That the hydrogen is

transmitted from the zinc to platina, during the chemical action, many experiments seem to prove; and that the hydrogen so transmitted, by its chemical agency, and in its nascent state, is capable of effecting many decompositions, which, under other circumstances, would be impossible. In the single combination above alluded to, if the dilute acid be separated from a solution of acetate of lead, or sulphate of copper, by a piece of bladder, the zinc being immersed into the acid part, and the platina into the metallic solution, no hydrogen will be afforded by the platina, but the metal becomes reduced in proportion to the quantity of hydrogen which has disappeared: yet no perceptible quantity of this effect can be attributed to the electricity of contact, but to the mere chemical agency of hydrogen in its nascent state. Hence we are inclined to think, that the decompositions by the galvanic battery arise from two causes. Water principally owes its decomposition to the chemical action, and the agency of the electricity upon the hydrogen. Metallic oxyds are principally decomposed by the presence of the nascent hydrogen, so collected and transmitted by the electricity. The decomposition of saline bodies, however, is to be attributed alone to the electrical attraction produced by the contact of the bodies employed, which can be made so great as to overcome the chemical attraction of the bodies decomposed. Of the latter of these powers of decomposition we have given some account, in detailing the ingenious experiments of sir Humphrey Davy; of the two former means of decomposition we shall say something in a practical point of view.

Many very anomalous facts were known in chemistry long previous to the discovery of Galvanism. All those chemical phenomena, under which the appearance called arborescence was observed, were inexplicable, till it was shewn from some experiments, published in Nicholson's Journal, vol. xv. p. 94, that Galvanism is the cause of these singular phenomena. In the experiment where lead is so beautifully precipitated, by suspending a piece of zinc in a solution of acetate of lead, the zinc first reduces a small portion of lead, which, with the zinc, forms a galvanic combination. The lead, if no solution of lead were present, would now give out hydrogen gas; but the hydrogen, instead of appearing in that form, combines with the oxygen of the oxyd, and the metallic lead is formed at the same point. Hence the lead appears to grow from the last point formed, which gives the appearance of vegetation. That this effect does not depend upon the presence of zinc, may be proved by the following experiment. Tie on one end of a glass tube, about half an inch wide, a piece of bladder, so that it may hold water, and fill it with a solution of acetate of lead. Into the other end insert a cork loosely, and through the cork let a platina wire pass within about half an inch of the bladder. Into a wine-glass put some dilute muriatic acid, in which place a zinc wire. When the tube with the bladder is immersed in the wine-glass, if that part of the zinc wire without the glass be brought into contact with that part of the platina wire without the tube, beautiful crystals of metallic lead will soon appear upon the platina wire. If the acetate of lead be removed, and a dilute acid be put in its place, bubbles of hydrogen will appear upon the platina wire.

Another experiment, similar to that of the lead-tree, and equally anomalous, has been long known in chemistry. If a plate of glass be smeared over with a solution of nitrate of silver, and a brass pin or a piece of zinc wire be laid in the middle of the plate, beautiful ramifications of silver will soon appear as if growing out of the pin, very much resembling vegetation. By observing the process with a magnifying glass, each branch of this arborescence may be seen to grow from the end or side of another; which proves that the silver forming the vegetative appearance is not reduced by the oxydable metal laid on the plate, but by something at the successive points of the silver branches. With a view to ascertain this fact, one half of the plate should be smeared with nitrate of silver, and the other half with dilute muriatic acid. If a piece of zinc wire be tied to a piece of platina wire, and the compound wire so bent that the zinc may touch the dilute acid, and the platina the nitrate of silver, the ramifications of silver will soon appear upon the platina wire. That the silver is reduced by the hydrogen carried in the galvanic current, is probable from varying the experiment as follows: If, instead of smearing the plate with nitrate of silver, the whole be covered with dilute acid, and the same compound arc be laid upon it, the platina will give out bubbles of hydrogen. In the common way of making this experiment with the pin, as well as the variation above stated, it appears that the process is kept up by the galvanic current, which furnishes the hydrogen. The pin first reduces a small portion of silver, which forms a galvanic combination with the pin. The hydrogen which, but for the presence of the remaining nitrate of silver, would appear in the gaseous form, is employed in depriving the silver of its oxygen. With the compound arc, the zinc does not require to touch the nitrate of silver, because the platina with zinc is already a galvanic combination. The theory of whitening common pins can be explained only on this principle. The tin, in a small proportion, is dissolved in the tartrate of potash; pieces of metallic tin, with the pins, are also present. The two latter form the galvanic combination, and a portion of tin is reduced from the solution upon the pins, to which they owe their whiteness. We may generally conclude, that in all instances where one metal becomes the precipitant of another, the precipitation is much facilitated by the agency of the galvanic combination, formed between the precipitating and the precipitated metals, and the consequent presence of hydrogen. If a piece of zinc be introduced into a solution of sulphate of copper, the zinc in the first instance becomes covered with copper, and the effect appears to stop. If, however, a very small excess of sulphuric acid be added, the process will go on with such rapidity, that the copper becomes precipitated in a very little time. By minutely observing the process, the copper will be seen to be reduced upon that already produced, which is a proof that it is not done by the mere agency of the zinc.

It appears very evident, that when a galvanic combination of zinc with any lesser oxydable metal is placed in a dilute acid, that a much larger quantity of hydrogen will be evolved from the lesser oxydable wire, than could possibly be produced by any electrical intensity generated by the contact of the bodies employed; but that independent of this, there is an immense quantity of electricity generated during the chemical action, by which the hydrogen is transported from the greater oxydable surface to the lesser one. If the quantity of hydrogen produced depended upon the attraction of the wires for the elements of the water, this power would depend upon the electrical intensity alone, and of course upon the series in the galvanic battery, whatever might be its surface; but it is found that the power of Galvanism to decompose water is much increased by an increase of surface only.

Galvanism as a Source of Heat.—When the wires coming from the ends of a galvanic battery of considerable surface are

are brought into contact, a brilliant spark is produced, and the wires stick together with considerable force, as if they were welded, or united by fusion. If the parts in contact be held with the fingers, a considerable heat will be perceived, which will be greater as the battery is more powerful, and inversely as the thickness of the wires.

Small wires seem to affect the electric fluid in a manner similar to that in which light is affected by a convex lens, or a concave mirror, by concentrating and compelling a large quantity of electricity to pass through a small channel. This appears to be the case with common electricity, as well as galvanism, since by discharging the electrical battery through very small wires, the metals become fused and oxydated.

On the galvanic battery this experiment should be made as follows: at each end of the battery should be placed a rod of metal, with a clean ball at the top of each. Between the two balls must be stretched a piece of very small wire, not exceeding $\frac{1}{100}$th of an inch in diameter, while the circuit is interrupted in some other part of the battery. As soon as the wire is fixed, the circuit must be completed where it was broken, and the current will instantly be determined through the small wire, which will in consequence become ignited.

It was discovered by Dr. Wollaston, that, in the ignition of wire by the voltaic battery, there was one certain diameter of the wire, in which the length ignited was the greatest, above or below which the length was less. This does not arise from more heat being sent through the wire in which the greatest length was ignited, but from the ratio of the surface of the very small wire being so much greater to its solidity than in thicker wire, by which a greater proportion of heat is carried off by radiation; but when the diameter is beyond a certain extent, then a less length is ignited, from the heat being less concentrated.

It has also been found, that very different lengths of wire are heated of different metals when their diameters are equal. This appears to take place from the relative conductive powers of the different metals for electricity, which appears to be as their conducting powers for heat. Platina, being the worst conductor, has a greater length heated; and silver, which is known to be a good conductor, has a less length heated.

If the battery be very powerful, it will be fused and oxydated. When a connection is formed between the two ends of the battery, by means of the very thin foils of metals, such as leaf-gold, the metals undergo brilliant combustion, exhibiting different coloured flames. Charcoal and plumbago, presented by sharp angles, are similarly deflagrated. If the ends of the two wires coming from the battery be made to touch each side of a small globule of mercury, the latter will inflame with a bright flash. This heat, furnished in the galvanic current, is also very apparent while it is passing through moist conductors. Different fluids subjected to decomposition in the circuit, in glass tubes, become considerably heated, and this will be found the case, as the diameter of the tube is less.

Sir H. Davy attributes this heat to the decomposition, which must strike any one as being an error. Heat we always find to be evolved during combination; the very reverse of which ought to take place during decomposition.

Action of Galvanism upon Animals.—All animal substances, either dead or living, if not deprived of their moisture, are tolerably humid conductors of Galvanism. In the living subject, independent of its conducting power, it has the property of being affected in a peculiar manner. All those animals which possess excitability are affected by Galvanism as they would be affected by any other violent stimulus; and if the excitable part be at all muscular, the fibres are vigorously contracted. This causes, in a living and conscious animal, a sensation not unlike an electric shock. The shock is more like that of common electricity, as the plates of the battery are smaller and more numerous. When the plates are of very large surface, a sort of vibratory motion is felt through the part attended with a sensation of heat; and this, in a powerful battery, is felt so long as the connection is kept up. The best mode of taking the shock is first to moisten the hands, or the part where the effect is to be applied; grasp in each hand a piece of metal, such as two spoons, and touch each end of the battery with the other ends of the spoons at the same time. If it is intended to be applied to any other part, let two plates, of about two inches in diameter, be each attached to the wires coming from the battery, and let the plates be applied to some two parts: if the effect be too severe, let some inferior conductor be placed between the plate and the skin.

Sir H. Davy found, that when an animal substance was placed in the circuit of a galvanic battery, the different compounds contained in it were decomposed. This was more especially the case with the saline bodies contained in the animal fluids; the acids of the salts were found on the positive side of the battery, and the bases of the salts on the negative. Should it be ascertained that any redundancy of saline matter is the cause of disease, Galvanism might be employed with great success in separating those bodies from the system.

Dr. Wollaston has given some hints in Nicholson's Journal, from which it appears probable that the power of the glands in secreting different fluids is dependent upon the electrical state of the glands; by which they are induced to attract all bodies in a contrary state to themselves. The opinion of this ingenious gentleman has been strongly corroborated by some experiments made by Messrs. Home and Brandt. Phil. Trans.

These, however, are speculations on which we cannot at present place strict reliance. The same conjecture which is applied to secretion may be applied to the oxygenation, or rather the decarbonization of the blood in the lungs; since the carbon appears to be transferred through the membranes between the pulmonary arteries and the interior of the lungs. The same theory may be also applied to account for the change of the colour of the blood between the fœtus and the mother. Muscular excitability may perhaps arise from a certain electric state of the muscular fibre caused and kept up by the arterial blood; and if we may be allowed to carry the conjecture still further, muscular motion may perhaps be caused by the relative electric states of the muscles, and the brain and nerves.

VOLTANA, in *Geography*, a town of Spain, in Aragon; 5 miles N.W. of Ainsa.

VOLTARE, Ital. in *Music-books*, to turn over; whence *volti*, turn, *volti subito*, turn quick, and often only the initials of these words V.S. *Si volti*, at the end of a movement, denote, the leaf is to be turned over to another movement. And, in courtesy, it is sometimes said, *volti se piace*, turn over if you please.

VOLTE, in the *Manege*, signifies a round or circular motion, consisting of a gait of two treads, made by a horse going sideways round a centre: the two treads making parallel tracks, one by the fore-feet, larger, and the other by the hind-feet, smaller; the shoulder bearing outwards, and the croup approaching towards the centre.

VOLTE, *Demi*, is a half-round of one tread, or two, made by the horse at one of the angles, or corners, of the volte, or at the end of the line of the passade; so as when

he is near the end of this line, or near one of the corners of the volte, he changes hands, to return by a semicircle.

VOLTE, *Reverted*, or *Inverted*, is a track of two treads, which the horse makes with his head to the centre, and his croup out; going sideways upon a walk, trot, or gallop; and tracing out a larger circumference with his shoulders, and a smaller with his croup. See on this subject Berenger's Art of Horsemanship, vol. ii. p. 83, &c.

VOLTE, in *Fencing*, denotes a sudden movement or leap, which is made to avoid the thrust of an antagonist.

VOLTERRA, DANIELE DI, in *Biography*, the cognomen of an artist of great renown, whose real name was Daniele Ricciarelli. He was a native of Volterra, and born in 1509, and was first a disciple of Giovanni Antonio Razzi, called Il Sodoma, and afterwards of Baldassare Peruzzi. Unemployed in his native city, and without means of improvement, he went to Rome, and wrought some time for cardinal Trivulzi, to whom a picture of the Flagellation he had brought with him served as a recommendation. He afterwards assisted Pierino del Vaga in the capella Massimi at the Trinita da Monti: and in San Marcello, where he finished, from the designs of del Vaga, the four Evangelists, with various other figures, and ornamental enrichments. From designs of the same master he also painted a frieze in the hall of the palazzo Massimi, and these works combined gave him so much renown, that signora Elena Orsina was induced to employ him to adorn her family chapel in the church of the Trinita da Monti.

He had in the mean time cultivated the friendship of Michel Angiolo and Sebastian del Piombo, and by their communion, and the study of their works, aggrandized his style and formed his manner; and the work which he produced in the capella Orsini, the Descent from the Cross, testified how worthy he was of such society. The work of this chapel, which was adorned not only with an altar-piece, but also with various other designs historical and ornamental, and all in fresco, occupied him seven years. The merit of the principal picture above-mentioned, has placed it, in public estimation, on a level with the Transfiguration by Raffaelle, and the Communion of S. Jerome by Dominichino; and induced the French, in their rage for spoliation, to attempt the removal of it from the wall. And they effected it, though they never transported it to France, but in doing so, they cut away so much of the angles of the chapel that the roof fell in, but not till the picture had been removed out of danger. It was afterwards turned, so that its face was made visible, and an attempt was made by some ignorant pretender to enliven the colours by means of oil or varnish: the consequence has been, that the surface is become black, and the figures scarcely discernible; and thus this grand work, one of the principal features of modern Rome, one of the greatest monuments of human ingenuity, and the support of the well-earned renown of an artist ranked among the best, has been sacrificed to ambition, vanity, and folly. Happily the composition is preserved by Dorigny's print, and there is a great number of copies of it. Lanzi is of opinion, that M. Angelo must have aided Volterra in this great work, particularly in the composition, as the other parts in the chapel are so far inferior to it. He is known to have been partial to him, and on terms of intimacy. One day calling in his absence at his study, he left behind a sketch of a colossal head, which Volterra never would permit to be removed, and which remains to this day. And when Pierino del Vaga died, and Angelo had the works of the Vatican assigned to him, he interested himself for and procured the appointment of Volterra to supply his place. To him also, with the consent of Angelo, pope Paul III. intrusted the slight clothing which is thrown over the nudities in the Last Judgment in the Sistini chapel, for which service however he was branded with the ludicrous name of *Il Brachettone*, the breeches-maker.

After his appointment in the Vatican, he was ordered to compleat the paintings in the Sala Regia begun by his predecessor, which he did, but not, as Vasari says, with skill equal to that he had exhibited in the chapel Orsini.

When Julius III. mounted the papal throne, he dismissed Volterra from his superintendance, but afterwards assigned to him one half of a hall to paint, of which Salviati had the other part, but Volterra did little or nothing in it, having been disappointed in not finding the whole intrusted to him.

He added, by means of his disciples, several other designs to the works in the Trinita da Monti, but turned his own mind principally to sculpture, and painted but little after this time. He died at Rome in 1566, aged 57.

VOLTERRA, in *Geography*, a town of Etruria. This was one of the ancient twelve cities, now a lonely, mean place, though it reckons 25 churches, chapels, and oratories, and about 20 convents and religious fraternities. It stands on a mountain, but the air is unwholesome: entire villages in the neighbourhood lie in ruins, and uninhabited, and the country all round is overrun with weeds and bushes, which unquestionably contribute to render the abode unhealthful. It has rich copper-mines, but not worked; 29 miles E.S.E. of Leghorn. N. lat. 43° 23′. E. long. 10° 52′.

VOLTOEGA, a town of Spain, in the province of Catalonia; 5 miles W. of Vique.

VOLTORE, a mountain of Naples, in Capitanata, E. of Monteverde.

VOLTRI, a town of the Ligurian Republic; 6 miles W. of Genoa.

VOLTUMNA, or VOLTURNA, in *Mythology*, a rural divinity of the Tuscans. Livy frequently mentions a temple belonging to her near the lake Ciminius, where the people debated concerning their affairs.

VOLTURARA, in *Geography*, a town of Naples, in Principato Ultra; 15 miles W. of Conza.

VOLTURARA, or *Vulturara*, a town of Naples, in Capitanata, the see of a bishop, suffragan of Benevento; 38 miles W.S.W. of Manfredonia. N. lat. 41° 28′. E. long. 15°.

VOLTURENA, a town of the Grisons, on the lake of Como.

VOLTURNALIA, among the Romans, a festival kept in honour of the god Volturnus, on the sixth of the calends of September, or 26th of August.

VOLTURNO, in *Geography*, a town of Naples, in Lavora, on a river of the same name, near its mouth; 12 miles W. of Capua.—Also, a river of Naples, which runs into the gulf of Gaeta, near Castel a Mare.

VOLTZHEIM, a town of Saxony, in the principality of Ruessen, near Gera, where Henry IV. gained a victory over Rodolphus, duke of Swabia, in the year 1080.

VOLVA, in *Botany*, the Wrapper, or covering, of the *Fungus* tribe, is used in two senses by Linnæus. In its original and most legitimate meaning, as explained in the *Philosophia Botanica*, p. 52, this term is appropriated to the membranous web, which conceals the unexpanded gills of an Agaric; and in many species, as the Common Mushroom, *Agaricus campestris*, separates at length from the margin of the head, and forms a permanent ring round the stalk. This sort of *Volva* is enumerated among the kinds of CALYX, and perhaps not improperly; see that article. The more usual idea of a *Volva* is that of an external covering, which enfolds

enfolds the whole fungus, in an early state of growth. In the genus *Phallus* it resembles a hen's egg; and is nearly similar in the *Agaricus volvaceus*, Sowerby's *Fungi*, t. 1. In the starry and vaulted Puff-balls this part is of a leathery texture when dry, more brittle when fresh. (See GEASTRUM.) In the *Lycoperdon phalloides* of Smith's *Spicilegium*, Sowerb. Fung. t. 390, now made a distinct genus, called *Batarrea*, by Persoon, the outer *Volva*, which remains in the ground, is filamentous.

VOLVA is also a word used by Scribonius Largus, and some other authors, to express the central part, or, as we call it, the core of the apple, in which the seeds are placed. He prescribes this in weaknesses of the stomach, and retchings to vomit.

VOLUBILE, or VOLUBILATE *Stem* or *Stalk*, in *Gardening*, a name given to those of many plants, as all those the stems or stalks of which are of a twining or winding climbing nature. They are commonly such as climb or ascend in a spiral manner round the stems, stalks, or branches of other plants, which happen to be situate near to them, round those of one another, or round sticks or stalks set for the purpose, and any thing of a similar kind that they may meet with in the course of their extending growth. The honey-suckle, the hop, the running kinds of kidney beans, and many other plants, are of this description.

The stems or stalks of this sort, in different kinds of plants, wind round or twist about others, or other substances, in different directions, either to the right or the left, according to the apparent diurnal motion of the earth in respect to the sun. The honey-suckle and the hop among garden plants turning to the left, while the different kinds of twining kidney beans turn to the right.

In garden culture, all those kinds of plants should be constantly suffered to take their own natural directions, and not be in any way thwarted in their modes of growth, as they never succeed well where that is the case, or afford so good a produce. And their supports, of whatever nature they may be, should always be fully adequate, and be well and firmly set into the ground, that they may not be in danger of giving way while the plants are rising upon them. It will seldom be necessary to stop the plants from running too high, but this may be occasionally of use in preventing their running up too weak.

VOLUBILES, or VOLUBILIS, in *Ancient Geography*, a town of Africa, in Mauritania Tingitana, upon the route, according to Anton. Itin. from Tocologida to Tingis, between Tocologida and Aqua Dacica; it was a Roman colony. Pliny calls it Volubile Oppidum, and gives an erroneous account of it. Hardouin differs from other geographers, who consider Fez as the ancient Volubilis, without sufficient reason. See FEZ.

VOLUBILIS CAULIS, in *Botany* and *Vegetable Physiology*, a Twining Stem, (see CAULIS and STEM,) is one which supports itself on other plants, independent of tendrils, by assuming a spiral direction, and embracing every thing that comes in its way. Each species of twining plant has its appropriate direction, in some to the right, in others to the left, nor can that direction be counteracted, or impeded, by any mechanical force. Many tendrils, on the contrary, make a greater number of convolutions in one direction, than in another, the better to ensure a support for the plant that is furnished with them.

VOLUCE, or VOLUCA, in *Ancient Geography*, a town of Hispania Citerior, E. of Clunia and S.W. of Numace.

VOLVENS OCULI, in *Anatomy*, a name given by Spigelius and some others, to one of the muscles of the eye, called by Cowper and Albinus, *obliquus inferior*.

VOLUERA, in *Geography*, a town of France, in the department of the Po; 7 miles S.W. of Trino.

VOLVIC, a town of France, in the department of the Puy de Dôme; 3 miles S.W. of Riom.

VOLVICARA, a town of Naples, in Calabria Citra; 9 miles E.S.E. of Scalea.

VOLUME, VOLUMEN, a book, or writing, of a fit bulk to be bound by itself.

The word has its rise *à volvendo, rolling*, or *winding;* the ancient way of making up books being in rolls of bark, or parchment.

This manner lasted till Cicero's time, and long after paper was invented, and books written upon it. The several sheets were glued, or pasted, end to end, written only on one side; and at the bottom a stick was fastened, called *umbilicus;* and at the other end a piece of parchment, on which was the title of the book in letters of gold. And yet, we are assured, king Attalus, or rather Eumenes, had, long before, done up some of his books in the square form; as having found the secret of parchment, which would bear writing on both sides.

The library of Ptolemy, king of Egypt, contained, according to Aulus Gellius, 300,000 volumes; and, according to Sabellicus, 700,000.

Raymund Lully wrote about 4000 volumes; of which we have divers catalogues extant. It is held, that Trismegistus wrote 6525 volumes; others say, 36,529: but it is much more rational to suppose, with La Croix, that it was the custom with the Egyptians to put all the books they composed under the name of *Trismegistus*.

At present, volume is chiefly used in the same sense with tome, for a part, or division, of a work, bound separately. In this sense we say, "The Councils are printed at the Louvre, in thirty-seven volumes." See TOME.

VOLUME *of a Body* is also used among foreign philosophers, for its bulk, or the space inclosed within its superficies.

VOLUME *de Voix*, in French *Music*, is the compass or extent of a voice from its lowest, or most grave sound, to the most acute. According to Rousseau, the common compass of voices is only eight or nine notes. There have been voices that have extended to two octaves of real voice, *voce di petto;* and Agujari, with the addition of two or three notes in falset, had a compass of three octaves.

There is another expressive acceptation of the word *volume* in speaking of a great voice: as it was justly said of Manzoli's vocal organ, that it was a *volume of voice*.

VOLUMUS, in *Law*, the first word of a clause in one species of the king's writs of protection, and letters patent.

VOLUNT, VOLUNTAS, is when a tenant holds lands, &c. at the will of the lessor, or lord of the manor.

VOLUNTARY, in the *Schools*. The generality of philosophers use voluntary in the same sense with spontaneous; and apply it to any thing arising from an internal principle, attended with a due knowledge of it.

Aristotle, and his followers, restrain the term voluntary to those actions that proceed from an inward principle, which knows all the circumstances of the action.

There are two things, therefore, required to the voluntariness of an action: the first, that it proceeds from an inward principle; thus, walking for pleasure-sake, is a voluntary action; as arising from the will commanding, and the moving faculty obeying, which are both internal. On the

the contrary, the motion of a man dragged to prison, is not voluntary.

The second, that the action be performed with a perfect intelligence of the end, and circumstances of it; in which sense the actions of brutes, children, sleeping people, &c. are not properly voluntary.

Anatomists distinguish between the voluntary and natural or involuntary motions in the body. Of the latter kind are those of the heart, lungs, pulse, &c.

VOLUNTARY, in *Music*, a piece played by a musician extempore, according to his fancy. This is often used before he begins to set himself to play any particular composition, to try the instrument, and to lead him into the key of the piece he intends to perform. See RESEARCH.

In these performances, we have frequently heard great players produce passages and effects in fits of enthusiasm and inspiration, that have never appeared on paper. In these happy moments

" Such sounds escape the daring artist's hand
As meditation never could command;
And though the slaves to frigid rules may start,
They penetrate and charm the feeling heart."

In the Philosophical Transactions, N° 483. sect. 2. we have a method of writing down extemporary voluntaries, or other pieces of music, as fast as any master can play them on the organ, or harpsichord; and that in a manner expressive of all the varieties those instruments are capable of. This is performed by a cylinder, turning equally upon its axis, under the keys of an organ, and by having points under the heads of the keys. Hence, when they are pressed down, they will make a scratch or mark on the cylinder, which may shew the duration of the note; and the situation of this mark on the cylinder will shew what note was touched. For farther particulars we refer the curious to the Transaction itself.

VOLUNTARY *Agent*, *Escape*, *Homicide*, *Novation*; see the substantives.

VOLUNTEERS, in the *Military Art*, persons who enter of their own accord to serve in the army. See LISTING.

On occasion of danger from invasion, the people have been nvited to form themselves into volunteer corps for their own protection. A plan for this purpose was proposed by earl Shelburne, then secretary of state, in 1782, when the French threatened an invasion of this country; but as peace soon took place, the plan was not put in execution. In similar circumstances of preparations on the part of the enemy, and menaces of a descent in 1797, a proposal of the same kind was made by Mr. Dundas, and accepted in every part of the kingdom with the utmost alacrity and zeal; and in a very few months a new army of citizens was enrolled and mustered, in appearance equal to the regular and militia forces, and in the discipline of the parade very little inferior. Previously to this, from the very commencement of the war, volunteer companies had been raised in different parts of England among the resident inhabitants, particularly in the towns contiguous to the sea-coast. At the same time troops of horse were levied among the gentlemen and yeomen of the country, upon the same principle with the volunteer companies. These were called the yeomanry cavalry. Of these volunteer corps, both of horse and foot, some served without any pay from government: others received pay and allowances, under certain regulations. The provisions and regulations, pertaining to volunteers, whilst their corps existed, were established by the 44 Geo. III. c. 54. But it is now needless to enlarge on this subject.

VOLUNTII, in *Ancient Geography*, a people who inhabited the E. coast of Hibernia, S. of the Daunii. Ptol.

VOLUNTOWN, in *Geography*, a town of Connecticut, was settled in 1696, containing 1016 inhabitants; 20 miles N.E. of Norwich.

VOLVOX, in the Linnæan system of *Natural History*, a genus of the order of Infusoria, in the class of Vermes. Its characters are, that it is inconspicuous with a naked eye, very simple, pellucid, and spherical. The body of this animal is smooth, gelatinous, roundish, without joints, and formed for a whirling or vertiginous motion. Its young are roundish, and lodged in small holes in different parts of the body. Of this genus, Gmelin enumerates ten species: *viz.* the *bulba*, *pileus*, *globator*, *dimidiatus*, *sphærula*, *uva*, *lunula*, *conflictor*, *pilula*, and *globulus*. See VERMES. See also GLOBE *Animalcule* and BEROE.

VOLUPIA, in *Mythology*, the goddess of pleasure, the feigned daughter of Cupid and Psyche, who had a temple at Rome, in which was her statue; and a festival in honour of her was celebrated annually on the 21st of December.

VOLURA, in *Geography*, a town of France, in the department of the Po, during the French revolution; 7 miles W. of Turin.

VOLUSENUS, FLORENTIUS, FLORENCE WILSON, in *Biography*, a distinguished poet of the 16th century, prosecuted his studies, first at Aberdeen, and afterwards at Paris, where he was intrusted with the tuition of cardinal Wolsey's nephew. After the uncle's death, he was patronized by two other cardinals, Jean de Lorraine and Jean de Bellay. As he was proceeding with the latter towards Rome, in 1538, he was seized with an indisposition which detained him at Carpentras. Here he waited on cardinal Sadolet, then bishop of the see; who was so delighted with his literary accomplishments and elegant manners, that he placed him at the head of a classical seminary in that city. Wilson afterwards intended to revisit his native country, but death overtook him at Vienna, in the year 1546. F. Wilson was a scholar whom Buchanan has celebrated as dear to the Muses. He is known as the author of a classical dialogue on tranquillity of mind, entitled "De Animi Tranquilitate Dialogus:" Lugd. apud Gnyphium 1543, 4to.

VOLUSPA, q. d. *the oracle of the prophetess*, in *Mythology*, a poem of about four hundred verses, forming part of the ancient *Edda*; which see.

The Edda is a collection of various odes, which, as some have suggested, are the fragments only of a much larger work, long lost to the world. It has been generally ascribed, as we have mentioned under the article EDDA, to Sæmund Sigfuson, an eminent Icelander, born A.D. 1056 or 1057, who, from his knowledge, writings, and various acquirements, has been called by succeeding authors, *Frode*, or the learned. His claims, however, have been contested; and strong reasons have been urged for believing that Sæmund did not compose, perhaps not even compile, the Edda which is ascribed to him. The principal opponent of Sæmund's claim to the first Edda is Arnas Magnæus; whose recondite inquiries into the early literature of Iceland have given him much celebrity. See his Life of Sæmund Frode, prefixed to the *Edda Sæmundar*, Hafniæ, 1787, cited by sir George Steuart Mackenzie, bart. in his "Travels in the Island of Iceland," 1810.

VOLUTA, the *Volute*, in *Natural History*, the name of a genus of shells, for an account of which see CONCHOLOGY. Gmelin enumerates 141 species.

VOLUTE,

VOLUTE, VOLUTA, in *Architecture*, a kind of spiral scroll, used in the Ionic and Composite capitals; of which it makes the principal characteristic and ornament.

Some call it the *ram's horn*, from its figure, which bears a near resemblance to it.

Most architects suppose, that the ancients intended the volute to represent the bark or rind of a tree, laid under the abacus, and twisted thus at each extreme, where it is at liberty: others will have it a sort of pillow or bolster, laid between the abacus and echinus, to prevent the latter being broken by the weight of the former, and the entablature over it; and, accordingly, they call it *pulvinus*. Others, after Vitruvius, will have it to represent the curls, or tresses, of a woman's hair.

The number of volutes in the Ionic order is four; in the Composite, eight.

There are also eight angular volutes in the Corinthian capital, accompanied with eight other smaller ones, called *helices*.

There are several diversities practised in the volute. In some, the list or edge, throughout all the circumvolutions, is in the same line or plane: such are the antique Ionic volutes, and those of Vignola. In others, the spires or circumvolutions fall back; in others, they project, or stand out. Again, in some, the circumvolutions are oval; in others, the canal of one circumvolution is detached from the list of another, by a vacuity or aperture. In others, the rind is parallel to the abacus, and springs out from behind the flower of it. In others, it seems to spring out of the vase, from behind the ovum, and rises to the abacus, as in most of the fine Composite capitals.

The volute is a part of great importance to the beauty of the column. Hence, architects have invented divers ways of delineating it. The principal are that of Vitruvius, which was long lost, and at last restored by Goldman; and that of Palladio. Daviler prefers the former as the easier. The manner of which is as follows:

Draw the cathetus F C (*Plate* XV. *Geometry*, *fig.* 19.) whose length must be half a module, and from the point C describe the eye of the volute A E B D, of which the diameter is to be $3\frac{1}{3}$ minutes; divide it into four equal sectors by the diameters A B, D E: bisect the radii C A, C B, in 1 and 4; construct a square 1, 2, 3, 4, from the centre C to the angles 2, 3; draw the diagonal C 2, C 3, and divide the side of the square 1, 4, into six equal parts, at 5, 9, C, 12, 8; then through the points 5, 9, 12, 8, draw the lines 5, 6, 9, 10, 12, 11, 8, 7, parallel to the diameter E D, which will cut the diagonals in 6, 7, 10, 11, and the points 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, will be the centres of the volute. From the first centre 1, with the interval I F, describe the quadrant F G, from the second centre 2, with the interval 2 G, describe the quadrant G H, and continuing the same operation from all the twelve centres, the contour of the volute will be completed.

The centres for describing the fillet are found in this manner: construct a triangle, of which the side A F (*fig.* 20.) is equal to the part of the cathetus contained between A F, and the side F V equal to C 1; on the side A F, place the distance F S from F towards A, equal to F S, the breadth of the fillet, and through the point S draw the line S T, which will be to C 1 in the same proportion as A S is to A F; place this line on each side of the centre C, on the diameter of the eye A B; divide it into three equal parts; and through the points of division, draw lines parallel to the diameter E D, which will cut the diagonals C 2, C 3, and you will have twelve new centres, from whence the interior contour of the fillet may be described, in the same manner as the exterior one was from the first centres.

Consoles, modillions, and other sorts of ornaments, have likewise their volutes, or scrolls.

VOLUTE, *Canal of the*. See CANAL.

VOLUTE, *Eye of the*. See EYE.

VOLUTELLA, in *Botany*, Forsk. Ægypt.-Arab. 84, so called on account of its twining and slender habit, is rightly pointed out by Jussieu, *Gen.* 440, on the authority of Vahl, as a *Cassytha*. Linnæus has marked it so in his own copy of Forskall's work. We presume it to be the identical *C. filiformis*. Forskall speaks of this plant as not uncommon in Arabia, where it climbs trees, entangling their branches very much. The *stem* is exceedingly slender, without branches or *leaves*; the *flowers* scarcely visible; the *berries*, which are eaten by children, are insipid, with a flavour of pepper, but no acrimony. Are there any considerable points of agreement between this obscure genus and *Asarum*?

VOLUTINA, in *Mythology*, a rural goddess of the Romans, whom they invoked, for the coat that covers the ear of corn.

VOLVULA, in *Natural History*, the name of an extraneous fossile body, nearly allied to the entrochus, being composed of the same substance, and being like that of a cylindric column, made up of several joints; the commissures of the joints are, however, much less visible in the volvulæ than in the entrochi, and they are not striated, as in the entrochus, from the centre to the circumference.

The volvulæ are of various figures; some resemble in shape a little bottle, and are called *volvulæ utriculatæ*, and of these some have, and others have not, a star marked on their bottom; others of them swell out in the middle, and taper a little toward each end; and these, from their resemblance in shape to a little barrel, are called *dolioli*, or *volvulæ doliatæ*. There is great reason, from the analogy these bear to the entrochi, and other fossils which owe their form to animal remains, to suppose these of the same origin; but we yet know not to what animal it is that they have belonged. Hill's Hist. Foss.

VOLVULUS, in *Botany*, a name given by Daleschamp, and some others, to the upright narrow-leaved or toad-flax-leaved bind-weed. See CONVOLVULUS.

VOLVULUS, in *Conchology*, a species of *Helix*, which see.

VOLVULUS, in *Entomology*, a species of *Cerambyx*, which see.

VOLVULUS, in *Medicine*, a name which some authors give to the iliac passion, by others called *chordapsus*; and by others, *miserere mei*.

VOLX, in *Geography*, a town of France, in the department of the Lower Alps; 6 miles S.E. of Forcalquier.

VOLZANA, a town of the duchy of Carniola, on the Lisonzo; 12 miles S.W. of Feldes.

VOMANO, a river of Naples, which runs into the Adriatic, 5 miles N.N.E. of Atri.

VOMANUS, in *Ancient Geography*, a river of Italy, in Picenum, still called Vomano.

VOMAS, in *Geography*, a town of France, in the department of the Allier; 18 miles E.S.E. of Moulins.

VOMER, in *Anatomy*, a bone of the nose. See CRANIUM.

VOMER, in *Ichthyology*, a species of zeus, with a forked tail and spine recumbent before the anal and dorsal fin. This is an American fish.

VOMICA, in *Natural History*, a word used by the ancients to express one of the blemishes to which crystals and the

the precious ſtones are ſubject. This is a duſky foulneſs lying deep in the ſtone, and giving a duſky colour and tinge to the whole. Both the luſtre and tranſparence of the ſtone are much hurt by this accident. When the vomica was of a bluiſh or blackiſh colour, the Romans expreſſed it by the word plumbago.

VOMICA, in *Medicine*, an abſceſs, or collection of purulent matter in the ſubſtance of the lungs. This, like all other abſceſſes, is the reſult of previous inflammation in the part which it occupies, and is, therefore, one of the terminations of peripneumony, of which, in that caſe, it conſtitutes the laſt ſtage. (See PERIPNEUMONY.) If a vomica burſts through the exterior ſurface of the lungs, and the matter conſequently eſcapes into the cavity of the thorax, the diſeaſe is then called *empyema*.

VOMICA, *Nux*, *Vomic Nut*. See NUX *Vomica*.

VOMIER, in *Botany*, Poiret in Lamarck Dict. v. 8. 692, a French name, whoſe derivation or meaning we cannot trace, applied by this author to our ERIOSTEMON; ſee that article.

VOMIT, BLACK, in *Medicine*, an appellation given by the firſt writers on the diſeaſes of tropical climates to the *yellow fever*, the moſt formidable and fatal ſymptom of which is a vomiting of a black matter, conſiſting of grumous blood and bile. This ſymptom, however early it appeared, was generally ſoon followed by death, and being the moſt remarkable and diſtreſſing character of the diſeaſe, its name was given to the whole fever: it is obſerved, however, in the bilious remittents of more northern latitudes, as of Spain and Egypt, and was noticed by Hippocrates as a fatal ſymptom of the *cauſos*, or ardent fever, endemic in his time in the countries bordering on the Mediterranean. See FEVER, *Yellow*.

VOMITING, in *Animals*, is the inverted action of the ſtomach, or the act of diſcharging the contents of it by the mouth. Of this the horſe is incapable or deprived, on account of a peculiarity of ſtructure in the parts; but dogs, cats, and other animals, vomit very readily, and are often much benefited in this way, by the uſe of proper medicines, in different diſeaſes with which they are affected.

VOMITING, in *Medicine*, the act of ejecting the contents of the ſtomach through the gullet and mouth, commonly preceded by a ſenſation of *nauſea*.

It has been a queſtion much diſcuſſed by phyſiologiſts, how the matters contained in the ſac of the ſtomach are thus forcibly expelled in a retrograde direction? ſome ſuppoſing that this was effected by the retrograde action of the muſcular coat of the ſtomach itſelf, and others contending that the action of the diaphragm and abdominal muſcles was the principal force employed in the act. This queſtion has been amply expounded, and the affirmative of the latter opinion ſhewn to be correct under the head of STOMACH, to which we refer the reader.

Vomiting is not to be conſidered as itſelf a diſtinct ſpecies of diſeaſe, but merely as a ſymptom of various morbid affections, either of the ſtomach itſelf, or of ſome other organ of the body with which it is connected by ſympathy. As a ſymptom, however, which is always diſtreſſing, and often very urgent, it frequently becomes the object of medical treatment, and it is therefore important to diſtinguiſh the cauſes from which it originates in different inſtances, in order that the appropriate remedies may be ſelected.

The firſt ſet of cauſes of vomiting, to which we have alluded, are thoſe which affect the ſtomach itſelf. There are various morbid conditions of that organ, or the irritation of ſubſtances introduced into it. Thus vomiting is a ſymptom of inflammation of the coats of the ſtomach (ſee GASTRITIS), which are rendered ſo irritable as to reject every thing introduced within its cavity. A ſcirrhous or cancerous ſtate of the ſtomach is alſo attended by vomiting, eſpecially when that diſeaſe diminiſhes the aperture of the pylorus, and prevents the paſſage of the aliment into the inteſtines. Vomiting is likewiſe often a ſymptom of *dyſpepſia*, or indigeſtion, and is then occaſioned either by the irritation of undigeſted food, or the acrimony of fluids generated during the imperfect proceſs of digeſtion: whence the matters vomited are often acid or acrimonious, irritating the gullet and fauces as they paſs. Sometimes in theſe caſes the vomiting is excited by the regurgitation of the bile, when it is ſuperabundant; but moſt commonly that fluid is only vomited after repeated and ſevere retchings, by which the bile is brought into the ſtomach from the upper inteſtine. Vomiting is ſometimes alſo a ſymptom of the ſtomach colic, or cramp in that organ, in which caſe, as in the inflammation, it is accompanied by intenſe pain.

The cure of the vomiting in theſe caſes will depend upon the removal of the reſpective diſeaſed conditions of the ſtomach of which it is ſymptomatic. In *gaſtritis*, it can only be removed by copious blood-letting, bliſtering, or cupping the region of the ſtomach, or applying leeches; for it is in vain to attempt to introduce medicine into an inflamed ſtomach; and opium would, if it could be retained, aggravate the original diſeaſe. In the cramp of the ſtomach, on the other hand, opium largely given, with hot fomentations, would be the moſt effectual remedy. In cancer or ſcirrhus, alleviation of the ſickneſs is all that can be expected; and opium or hyoſcyamus affords the beſt means of ſoothing that malady. In a ſtate of indigeſtion, vomiting will be cured by adhering to a light and digeſtible diet; by the uſe of abſorbents, ſuch as magneſia or chalk, with light aromatics, eſpecially where the vomitings are acid; and by whatever ſtrengthens the tone of the ſtomach, and improves the digeſtive function; ſuch as bitters, horſe-exerciſe, cold-bath, &c.

When vomiting is produced by ſubſtances taken into the ſtomach, and immediately irritating its ſenſible ſurface, ſuch as the metallic or other poiſons; the obvious remedy will be to get rid of the irritating ſubſtance, if poſſible, to dilute and weaken its acrimonious quality, or to change or decompoſe it by chemical means. In all ſuch caſes, the copious introduction of tepid fluids ſhould be immediately reſorted to.

The ſecond ſet of cauſes of vomiting, which we have mentioned above, are thoſe which influence the ſtomach only by ſympathy, the actual ſeat of the irritation being in ſome other, even diſtant organ; the varieties of the cauſes producing vomiting in this indirect way are, therefore, as numerous as the ſympathies of that important organ with almoſt every other organ in the body.

Many affections of the head are attended with vomiting. *Vertigo*, or giddineſs, from whatever cauſe it originates, is liable to induce nauſea, and even that moſt violent and diſtreſſing ſpecies of vomiting, *ſea-ſickneſs*. (See VERTIGO.) Blows on the head, inflammation of the brain or its membranes, fractures and depreſſions of the ſkull, are almoſt conſtantly productive of vomiting; which, in ſuch caſes, can of courſe only be relieved by removing the preſſure or curing the inflammation of the brain.

With almoſt every organ of the abdomen the ſtomach ſympathiſes ſo cloſely, that violent vomiting is the conſequence of irritations in moſt of them. The kidneys are ſeldom affected with diſeaſe, without producing ſickneſs in the

the stomach, and the most violent and unremitting retching is occasioned by the existence of a small calculus in the pelvis of the kidney, or its passage along the ureter into the bladder. With both colic, or spasmodic constriction, and inflammation of the intestinal canal, vomiting is a constant attendant; and it often accompanies diseases of the liver. Affections of the uterus in women very frequently occasion sickness, and among the first symptoms of the distension of that organ in pregnancy, nausea and vomiting frequently occur.

Although these sympathetic vomitings are manifestly dependent on other irritations, the removal or alleviation of which will be the only effectual cure, by means adapted to them respectively; yet some alleviation of these sicknesses is often attainable by diminishing the irritability of the stomach itself. The carbonic acid, or fixed air, appears to have this quality in a certain degree, whence soda-water, or the saline draught, swallowed during the effervescence, will sometimes materially allay these sympathetic vomitings. This is also occasionally effected by an absorbent, with a light aromatic, or a cordial distilled water. Thus a little magnesia in peppermint or pimento water will sometimes allay such a sickness. An opiate, or the extract of hop or henbane, may be now and then added to these medicines with advantage, as they tend to lessen the irritability, and render the stomach less sensible to the irritation.

VOMITING *of Blood*. See HÆMATEMESIS.

VOMITING *excited by Medicine*. See EMETICS.

VOMITING *Julep*. See JULEP.

VOMITIVES, or VOMITIVE *Medicines*. See EMETICS.

VONA, in *Geography*, a town of Asiatic Turkey, in the government of Sivas; 70 miles W. of Trebisond. N. lat. 41° 10'. E. long. 38°.

VONC, a town of France, in the department of the Ardennes; 6 miles N. of Vouziers.

VONDEL, JOOST VANDEM, in *Biography*, a Dutch poet, was the son of parents who belonged to the sect of Mennonites, and born at Cologne in the year 1587. His education was merely adapted to trade, and having married in 1610, he commenced business as a hosier at Amsterdam; but with talents superior to his station, he entrusted his wife with the conduct of his trade, and directed his attention to literary and religious speculations. In the disputes between the Arminians and Gomarists, he took part with the former, and joined their communion. His first poetical productions were the mere fruits of untaught genius; but apprehending that he might derive advantage from those sources of information to which he had no access, on account of his ignorance of the learned languages, he began, at the age of 30 years, to learn the Latin and French, and to study logic. Attached to the Arminian party, he exposed the injustice of the sentence against Barneveldt in an allegorical tragedy, entitled "Palamedes, or Innocence oppressed," for which he was prosecuted and fined. Conceiving prejudices against the reformed religion, probably on account of the attachment of the Dutch ministers to the Orange faction, he became a Roman Catholic; and afterwards published a tragedy, intitled "Gisbert Van Amstel," or the capture of Amsterdam by Florence V. count of Holland; and many other poems, one on the subject of "The Mysteries, or the Secrets of the Altar." He also translated into Dutch verse Virgil, Horace, and Ovid's Metamorphoses, by which he gained considerable reputation. But, like many authors, he neglected his affairs, and suffered pecuniary embarrassments. He lived however to a great age, and closed life in 1679, in his 92d year; having acquired the honour of being regarded as one of the principal ornaments of his country. His works amount to nine vols. 4to. Moreri.

VONJASH, in *Geography*, a town of Abascia, on the Black sea; 30 miles N.W. of Mamak.

VONITZA, a town of European Turkey, in Albania; 62 miles N.W. of Lepanto. N. lat. 39° 15'. E. long. 21° 2'.

VOOR, in *Agriculture*, a term applied to fallow land, or such as is frequently ploughed over, in different cases. See FALLOW.

VOORN, or OOST-VOORN, in *Geography*, an island of Holland, situated at the mouth of the Meuse; about 20 miles in length, and 5 in breadth. This island, with Goree and Overflakee, form the territory called *Voornland;* which formerly belonged to Zealand: Briel is the capital.

VOORN, a small island at the union of the Wahal and the Meuse, with a fort belonging to the state of Utrecht; 9 miles N.N.E. of Bois le Duc.

VOPISCUS, a Latin term, used in respect to twins in the womb, for that which comes to the perfect birth; the other being before excluded abortive.

VOPISCUS, FLAVIUS, in *Biography*, a Latin historian, was a native of Syracuse, and flourished about A.D. 304. He began his history with the reign of Aurelian, which he prosecuted with those of Tacitus and his brother Flavianus, and Probus. He then published an account of the four tyrants, Firmus, Saturninus, Proculus, and Bonosus, and also of the three emperors Carus, Numerianus, and Carinus. These are extant, and are contained in the "Historiæ Augustæ Scriptores." Among the best of these is Vopiscus, who excelled in learning, and also in chronological arrangement. He is said to have given credit to the wonderful works of Apollonius Tyaneus, whose life he had an intention of writing.

VOPOKAS, in *Geography*, a town of Russia, in the province of Ustiug, on the Vitchegda. N. lat. 63° 10'. E. long. 54° 14'.

VORALBERG, a tract of country, containing some lordships, S.E. of the lake of Constance; so called from the mountain of Alberg, near which it is situated; ceded to Bavaria by the peace of Presburg.

VORALEN, a town of Hinder Pomerania; 10 miles S.W. of New Stettin.

VORAU, a town of the duchy of Stiria; 7 miles N.W. of Hardberg.

VORBACH ZOMMERN, a town of the county of Hohenloe; 3 miles E.S.E. of Weickersheim.

VORCHEIM. See FORCHEIM.

VORCLUT, a cape of the island of Jersey; 5 miles N.E. of St. Helier.

VORDEN, or VOERDEN, a town of Westphalia, in the bishopric of Paderborn; 17 miles E.N.E. of Paderborn. N. lat. 51° 45'. E. long. 9° 18'.

VORDEN, a town of Westphalia, in the bishopric of Osnabruck. Both the Roman Catholics and Lutherans have a church here in common; 10 miles N.N.E. of Osnabruck. N. lat. 52° 29'. E. long. 8° 4'.

VORDENBURG, a town of the duchy of Stiria; 4 miles N. of Leoben.

VORDENSES, in *Ancient Geography*, a people of Gallia Narbonnensis, W. of the Vulgientes. They are placed by some on the scite of the town of Gordes, near that of Apt.

VORE, in *Agriculture*, a term sometimes used to signify the narrow strip of ground which is left whole, for turning the furrow-slice upon, in some modes of paring and burning. It

It is also applied to the head of the teazle plant, which does not become ripe and run until the third year, such heads being called vores.

VOREDA, in *Ancient Geography*, a Roman station, marked in the second Iter of Antonine between Lugvallium (Carlisle) and Brovonacis (Kirbythure), situated at Old Penrith. This, without doubt, was the place where this station was situated, at the N.W. end of Plumpton wall, about 4 miles to the N. of the present town of Penrith, on a noble military way, which is there in the highest preservation.

VOREPPE, in *Geography*, a town of France, in the department of the Isere; 8 miles N.N.W. of Grenoble.

VORGANIUM, in *Ancient Geography*, the capital of the Osismii, who occupied the western part of Brittany, through its whole extent.

VORINGEN, or *Stadt Voringen*, in *Geography*, a town of Germany, in the principality of Hohen Zollern, on the Lauchart, formerly the chief place of a county, now extinct; 10 miles S.E. of Hohen Zollern. N. lat. 48° 11′. E. long. 9° 15′.

VORMS, called *Vormsisaari*, and in modern charts *Ormson*, an island of the Baltic, 14 versts in length, in breadth rather more than 9 versts, and of a nearly quadrangular shape.

VOROCHITA, in *Ancient Geography*, an island of the Persian gulf, upon the coast of Carmania. Ptolemy.

VORONEZ, in *Geography*, a town of Russia, and capital of a government, called "Voronezskoi," situated at the conflux of a small river, called by the same name, with the Don; and surrounded with wooden walls. The citadel is on the opposite side of the Voronez river, furnished with 150 pieces of cannon, and a large garrison. Here are docks for building vessels, large and small, good warehouses for naval stores, &c. It is the see of a bishop, and a place of considerable trade. The number of inhabitants is about 12,000; 256 miles S. of Moscow. N. lat. 51° 36′. E. long. 39°.

Voronez, a river of Russia, which runs into the Don at Voronez.

VORONEZSKOI, a government of Russia, bounded on the north-east by Tambovskoe, on the south and south-east by the country of the Cossacks, on the north-west by Orlovskoe, on the west by Kurskoe and Charkovskoe; about 260 miles in length, and 104 in its mean breadth. N. lat. 48° 50′ to 53° 16′. E. long. 37° to 42°.

VORRACH, a town of Bavaria, in the territory of Nuremberg; 4 miles N. of Nuremberg.

VORRAGE, in *Agriculture*, a term applied to the earth or mould which is collected and provided for "milling" or mixing with lime, in the making of composts.

VORSE, in *Geography*, a river of France, which runs into the Oise, near Noyon.

VORSKLA, a river of Russia, which runs into the Dnieper, 20 miles E. of Kreumengug.

VORST, a town of the duchy of Wurzburg; 6 miles E. of Schweinfurt.

VORSTIUS, Conrad, (Von Dem Vorst,) in *Biography*, an eminent Arminian divine, was born at Cologne in 1569, and finished his classical instruction at Dusseldorp. Having been entered at the college of St. Lawrence in Cologne in 1587, he left it without taking a degree, because his conscience would not allow his swearing adherence to the decrees of the council of Trent. At this time the circumstances of his family rendered it expedient for him to turn his attention to trade, for which he qualified himself by learning arithmetic, and the French and Italian languages. However, he afterwards, viz. in 1589, resumed his studies at Herborn; and in 1593 he accompanied some young persons of rank as their tutor to Heidelberg. Here he was created a doctor of divinity, and he then visited the academies of Switzerland and Geneva. At Geneva he read lectures on theology, and was offered a professorship; but declining this, he accepted a similar office at Steinfurt in 1596, where he gained such reputation as to induce other Protestant universities to invite him to the theological chair. His orthodoxy being suspected, he repaired to Heidelberg for a certificate of his soundness in the faith, protesting against the opinions of Socinus, and apologising for some expressions which he had used in their favour. In 1610 he removed from Steinfurt, to succeed Arminius as theological professor at Leyden. Here the Gomarists, or rigorous Calvinists, appealing to his work, intitled "Tractatus Theologicus de Deo, sive de Natura et Attributis Dei," charged him with many heresies; and not only engaged several foreign universities in their party, but induced our royal pedant, James I., to aid them with his concurrence. The king, acute in discovering theological errors, and fond of exercising his authority in suppressing them, sent to his resident at the Hague a list of various heresies, which he had by an hour's reading found in Vorstius's book; and notified to the states how much he detested these errors, and the persons who tolerated them. In order to maintain consistency of conduct, his majesty ordered several copies of Vorstius's book to be committed to the flames at London, Oxford, and Cambridge. He also wrote to the states, vehemently urging them to dismiss the professor, whose blasphemies, if he continued to maintain them, would justify his being burnt; and at the same time menacing, that unless they were ardent in extirpating "these germs of atheism, he would publicly separate from such false and heretical churches; and, as defender of the faith, exhort all other reformed churches to take common council for extinguishing and sending back to hell these abominable heresies; and would forbid all his own subjects to haunt so infected a spot as the university of Leyden." James also wielded his pen against Vorstius, who resisted the attack by a short and respectful reply. The States were not much moved by the threats of the authoritative and incensed monarch; for, though they suspended the professor till he had an opportunity of exculpating himself, they appointed a conference at the Hague, in April, 1611, between six ministers of both of the opposite parties, in presence of the curators of the university of Leyden, before whom Vorstius pleaded his own cause, and they determined in his favour. The triumph of Vorstius would have been complete, if he had not been implicated in a suspicion of heresy, occasioned by the publication, on the part of some of his disciples, of a small tract, intitled "De Officio Christiani Hominis," which contained Anti-Trinitarian doctrines. Vorstius, though he signed a confession of faith conformable to the Trinitarian system, found it expedient to relinquish his professorship, and to remove from Leyden till the storm subsided. Accordingly he withdrew to Tergou in 1612, and resided there for seven years, without a shade on his character. In 1619 a synod was held at Dordrecht, in which the Anti-Arminian party was predominant. This synod condemned Vorstius, unheard, as unworthy of the professorship; and in consequence of this judgment, the States deprived him of it, and for ever banished him from their territories. He lived two years longer in secrecy, but not without apprehension for the safety of his life. At length the duke of Holstein collected the dispersed relics of the Arminians,

Arminians, and gave them a place for building a town, to which Vorstius repaired in 1622; but being soon taken ill, he died at Tonningen, in September, at the age of 53 years, with every token of pious resignation. His remains were interred at Fridrichstadt, the new Arminian settlement, with great solemnity. He is known as the author of several theological writings, chiefly relating to the controversy between the Roman Catholics and his Protestant antagonists. His son, *William Henry Vorstius*, published some works in rabbinical literature. Bayle.

Vorstius, John, a German theologian, was born at Ditmarsh, in Holstein, and joining the Calvinist church, though a native Lutheran, became librarian to the elector of Brandenburg, in which connection he died in 1676. He was skilled in the Latin, Greek, and Hebrew languages, and published several learned works. The earliest of these was printed at Rostock in 1641, and intitled "Quædam de Stylo Novi Testamenti excogitata." The first part of this work, on the Hebraisms of the New Testament, was printed at Leyden, in 1658, 4to. under the title of "Philologia Sacra;" and the second part at Amsterdam, in 1665, 2 vols. 4to., and at Frankfort in 1705. Other tracts on scriptural topics were published in the "Fasciculus Opusculorum Historicorum et Philologicorum," Rotterd. 1693. Moreri.

VORTEX, Whirlwind, in *Meteorology*, a sudden, rapid, violent motion of the air, in gyres, or circles. See Whirl-*Wind*.

Vortex, *Vorago*, is also used for an *eddy*, or *whirlpool*, or a body of water, in certain seas and rivers, which runs rapidly round, forming a sort of cavity in the middle.

The ordinary course of these vortices is a gulf or outlet, by which the water of the sea, &c. is absorbed, or precipitates itself into some other receptacle: sometimes to some other communicant sea; and sometimes, perhaps, into the vast abyss of central water.

Vortex, *an Artificial*, expressive of the phenomena of the natural ones, may be made with a cylindric vessel, placed immoveable on an horizontal plane, and filled to a certain height with water. In this water a stick being plunged, and turned round as briskly as may be, the water is necessarily put into a pretty rapid circular motion, and rises to the very edge of the vessel; and, when there arrived, ceases to be farther agitated.

The water thus raised forms a cavity in the middle, whose figure is that of a truncated cone; its base is the same with the upper cavity of the vessel; and its vortex in the axis of the cylinder.

What raises the water at the side of the vessel, which occasions the cavity in the middle, is its centrifugal force. For the motion of the water being circular, it respects a centre taken in the axis of the vessel; or, which is the same, in the axis of the vortex formed by the water; the same velocity, then, being impressed on all the water, the circumference of a smaller circle of water, or a circle less remote from the axis, has a greater centrifugal force than another that is greater or more remote from the axis. The smaller circle, therefore, drives the greater towards the side of the vessel; and from this pression, or impulsion, which all the circles receive from the smaller ones that precede them, and convey to the greater which follow them, arises that elevation of the water along the edge of the vessel to the very top, where we suppose the motion to cease.

With a vortex thus formed, Mr. Saulmon, of the Royal Academy of Sciences, made divers experiments, by putting several solid bodies therein, to acquire the same circular motion, with intent to discover which of them, in making their revolution round the axis of the vortex, approach toward, or recede from it, and with what velocity. The result was, that the heavier the body, still the greater was its recess from the axis.

Mr. Saulmon's view, in this attempt, was to shew how the laws of mechanics produce the celestial motions, and that it is probably to those motions that the gravity or weight of bodies is owing. But, unhappily, the experiments shew just the contrary of what they should do, to confirm the Cartesian doctrine of gravity. See Whirling *Table*.

Vortex, in the *Cartesian Philosophy*, is a system or collection of particles of matter moving the same way, and round the same axis.

Such vortices are the grand machines by which these philosophers solve most of the motions, and other phenomena of the heavenly bodies. Accordingly, the doctrine of these vortices makes a great part of the Cartesian philosophy.

The matter of the world they hold to have been divided at the beginning into innumerable little equal particles, each endowed with an equal degree of motion, both about its own centre, and separately, so as to constitute a fluid.

Several systems, or collections of this matter, they farther hold to have been endowed with a common motion about certain points, as common centres, placed at equal distances, and that the matter, moving round these, composed so many vortices.

Then, the primitive particles of the matter they suppose, by these intestine motions, to become, as it were, ground into spherical figures, and so to compose globules of divers magnitudes; which they call *the matter of the second element*: and the particles rubbed, or ground off them, to bring them to that form, they call *the matter of the first element*.

And since there would be more of this first element than would suffice to fill all the vacuities between the globules of the second, they suppose the remaining part to be driven towards the centre of the vortex, by the circular motion of the globules; and that being there amassed into a sphere, it would produce a body like the sun.

This sun being thus formed, and moving about its own axis with the common matter of the vortex, would necessarily throw out some parts of its matter, through the vacuities of the globules of the second element constituting the vortex; and this especially at such places as are farthest from its poles; receiving, at the same time, in, by these poles, as much as it loses in its equatorial parts. And, by this means, it would be able to carry round with it those globules that are nearest with the greater velocity; and the remoter with less. And, by this means, those globules which are nearest the centre of the sun, must be smallest; because, were they greater, or equal, they would, by reason of their velocity, have a greater centrifugal force, and recede from the centre. If it should happen, that any of these sun-like bodies, in the centres of the several vortices, should be so incrustated and weakened, as to be carried about in the vortex of the true sun; if it were of less solidity, or had less motion, than the globules towards the extremity of the *solar* vortex, it would descend towards the sun, till it met with globules of the same solidity, and susceptible of the same degree of motions with itself; and thus, being fixed there, it would be for ever after carried about by the motion of the vortex, without either approaching any nearer to, or receding from, the sun; and so would become a planet.

Supposing then all this, we are next to imagine, that our system was at first divided into several vortices, in the centre of each of which was a lucid spherical body; and that some of

of thefe, being gradually incruftated, were fwallowed up by others which were larger, and more powerful, till at laft they were all deftroyed, and fwallowed up, by the biggeft *folar* vortex; except fome few which were thrown off in right lines from one vortex to another, and fo become comets. See CARTESIAN *Philofophy*.

But this doctrine of vortices is, at beft, merely hypothetical. It does not pretend to fhew by what laws and means the celeftial motions are really effected, fo much as by what means they poffibly might, in cafe it fhould have fo pleafed the Creator. But we have another principle which accounts for the fame phenomena as well, nay better than that of vortices; and which we plainly find has an actual exiftence in the nature of things: and this is gravity, or the weight of bodies.

The vortices, then, fhould be excluded from philofophy, were it only that two different adequate caufes of the fame phenomena are inconfiftent.

But we have other objections againft them. For, 1. If the bodies of the planets and comets be carried round the fun in vortices, the bodies of the parts of the vortex immediately invefting them, muft move with the fame velocity, and in the fame direction; and befides, they muft have the fame denfity, or the fame vis inertiæ. But it is evident, that the planets and comets move in the very fame parts of the heavens with different velocity, and in different directions. It follows, therefore, that thofe parts of the vortex muft revolve at the fame time, in different directions, and with different velocities; fince one velocity and direction will be required for the paffage of the planets, and another for that of the comets.

2. If it were granted, that feveral vortices are contained in the fame fpace, and do penetrate each other, and revolve with divers motions; fince thofe motions muft be conformable to thofe of the bodies, which are perfectly regular, and performed in conic fections; it may be afked, How they fhould have been preferved entire fo many ages, and not difturbed and confounded by the adverfe actions and fhocks of fo much matter as they muft meet with?

3. The number of comets is very great, and their motions are perfectly regular, obferving the fame laws with the planets, and moving in orbits that are exceedingly eccentric. Accordingly, they move every way, and to all parts of the heavens, freely pervading the planetary regions, and going frequently contrary to the order of the figns; which would be impoffible, unlefs thefe vortices were removed.

4. If the planets move round the fun in vortices, thofe parts of the vortices next the planets, we have already obferved, would be equally denfe with the planets themfelves: confequently the vortical matter contiguous to the perimeter to the earth's orbit, would be as denfe as the earth itfelf: and that between the orbits of the earth and Saturn muft be as denfe, or denfer. For a vortex cannot maintain itfelf, unlefs the more denfe parts be in the centre, and the lefs denfe towards the circumference: and fince the periodical times of the planets are in a fefquialterate ratio of their diftances from the fun, the parts of the vortex muft be in the fame ratio. Whence it follows, that the centrifugal forces of the parts will be reciprocally as the fquares of the diftances. Such, therefore, as are at a greater diftance from the centre, will endeavour to recede with the lefs force. Accordingly, if they be lefs denfe, they muft give way to the greater force, by which the parts nearer the centre endeavour to rife. Thus, the more denfe will rife, and the lefs denfe defcend; and thus there will be a change of places, till the whole fluid matter of the vortex be fo adjufted, as that it may reft in equilibrio.

Thus will the greateft part of the vortex without the earth's orbit have a degree of denfity and inactivity, not lefs than that of the earth itfelf. Whence the comets muft meet with a very great refiftance, which is contrary to all appearances. Cotef. Præf. ad Newt. Princ. The doctrine of vortices, fir Ifaac Newton obferves, labours under many difficulties: for a planet to defcribe areas proportional to the times, the periodical times of the vortex fhould be in a duplicate ratio of their diftances from the fun; and for the periodical times of the planets to be in a fefquiplicate proportion of their diftances from the fun, the periodical times of the parts of the vortex fhould be in the fame proportion of their diftances: and, laftly, for the lefs vortices about Jupiter, Saturn, and the other planets, to be preferved, and fwim fecurely in the fun's vortex, the periodical times of the parts of the fun's vortex fhould be equal. None of which proportions are found to obtain in the revolutions of the fun and planets around their axes. Phil. Nat. Princ. Math. apud Schol. Gen. in Calce.

Befides, the planets, according to this hypothefis, being carried about the fun in ellipfes, and having the fun in the umbilicus of each figure, by lines drawn from themfelves to the fun, do always defcribe areas proportionable to the times of their revolutions, which that author fhews the parts of no vortex can do. Schol. prop. ult. lib. ii. Princip.

Again, Dr. Keill proves, in his Examination of Burnet's Theory, that if the earth were carried in a vortex, it would move fafter in the proportion of three to two when it is in Virgo than when it is in Pifces; which all experience proves to be falfe.

We have, in the Philofophical Tranfactions, a phyfico-mathematical demonftration of the impoffibility and infufficiency of vortices to account for the celeftial phenomena by Monf. de Sigorne. See No. 457. fect. vi. p. 409. feq.

This author endeavours to fhew, that the mechanical generation of a vortex is impoffible; that it has only an axifugal, and not a centrifugal and centripetal force; that it is not fufficient for explaining gravity and its properties; that it deftroys Kepler's aftronomical laws; and therefore concludes with fir Ifaac Newton, that the hypothefis of vortices is fitter to difturb than explain the celeftial motions. We muft refer to the differtation itfelf for the proof of thefe affertions. See CARTESIAN *Philofophy*.

VORTICELLA, in the Linnæan fyftem of *Zoology*, a genus of Vermes Infuforia, the characters of which are, that the body is naked and contractile, with a rotatory or whirling motion. Gmelin enumerates fifty-one fpecies. See VERMES.

VORTITZA, or VOSTITZA, in *Geography*, a town of European Turkey, in the Morea, on the S. coaft of the gulf of Lepanto; 40 miles N.W. of Corinth.

VOS, MARTIN DE, in *Biography*, an eminent Flemifh painter, fon of Peter de Vos, who was himfelf an artift and member of the academy at Antwerp. He was born at Antwerp in 1520. His father initiated him in the art, but he afterwards ftudied under F. Floris until he was twenty-three, and then purfued the cultivation of his mind in Italy. The refidence he made at Venice introduced him to the acquaintance of Tintoretto, who not only inftructed him in the principles of his practice, but employed him to paint landfcapes in his pictures. Hence De Vos became an admirable colourift, and gained confiderable reputation and employment. He painted portraits of the family of the Medici, and fome hiftorical pictures for them; and after an abfence of eight years returned

turned to Flanders. His celebrity accompanied him, and procured him several commissions to paint pictures for churches at Antwerp, and at other places in the Netherlands. In portraiture also he was much employed, and he certainly advanced beyond his contemporaries, in the nature and truth which he gave to his productions. His principal works in the cathedral of Antwerp, are the Marriage of Cana; the Incredulity of Thomas; the Miracle of the Loaves; and the Resurrection; and a fine picture of his of the Last Supper is in the church of St. James. He became a member of the academy at Antwerp in 1559, and died, at the age of 84, in 1604. He had a brother, Peter de Vos, who also painted history, but whose works are not much known; a nephew also of his was a painter, William de Vos, who had considerable talents, and gained much employment and reputation.

Vos, Paul de, another painter of that name, but of a different family, was born at Alost in 1600. His works of animals and birds are very much in the style of Snyders, and are deservedly esteemed. There are many of them in the royal collection in Spain.

Vos, Simon de, born at Antwerp in 1643, was a pupil of Rubens, and became eminent as a painter both of history and portraits. Some of his paintings in the churches of Antwerp have been mistaken for the production of his great master. Sir Joshua Reynolds speaks highly of his picture of St. Norbert receiving the Sacrament, in the church of St. Michel, in which he says, "a great number of portraits are introduced extremely well painted," and afterwards commends him as a portrait-painter; particularly speaking of his own portrait in the poorhouse of Antwerp, painted by himself in black, leaning on the back of a chair, with a scroll of blue paper in his hand, so highly finished in the broad manner of Corregio, that nothing can exceed it. S. de Vos was living in 1662.

VOSAVIA, in *Ancient Geography*, a place of Belgic Gaul, upon the route from Antunnacum to Mayence, between Bontobrice and Bingium, according to the table of Peutinger.

VOSGES, in *Geography*, a large chain of mountains, which formerly occupied the S.E. part of Lorrain, and now gives name to a department of France. It was formerly covered with wood, and harboured abundance of game and wild beasts, and has long been famous for mines of silver, copper, and lead.

Vosges, one of the ten departments of the N.E. region of France, formerly the S. part of Lorrain, west of Upper Rhine, in N. lat. 48° 15′; bounded on the N. by the departments of the Meuse, the Meurte, and the Lower Rhine, on the E. by the department of the Upper and Lower Rhine, on the S. by the department of the Upper Saône, and on the W. by the department of the Upper Marne, containing 6522½ kiliometres, or 3296 leagues, and 308,052 inhabitants. It comprehends 5 districts, 30 cantons, and 550 communes. Its circles are Neufchateau, containing 55,247 inhabitants; Mirecourt, 66,649; Epinal, the capital, 62,592; St. Die, 75,298; and Ramiremont, 48,270. According to Hassenfratz, this department is 26 French leagues long, and 16 broad, and is divided into nine circles and communes, and contains 289,054 inhabitants. The contributions in the 11th year of the French era amounted to 1,839,254 fr., and the expences of administration, of justice, and of public instruction, were 242,372 fr.

VOSKRESENSK, a town of Russia, in the government of Moscow; 32 miles N.W. of Moscow. N. lat. 56°. E. long. 36° 44′.

VOSKRESENSKOI, a town of Russia, in the government of Pskov, on the Lovat; 20 miles N. of Cholm.—Also, a town of Russia, in the government of Petersburg, on the E. coast of lake Ladoga; 80 miles N.E. of Petersburg.—Also, a town of Russia, in the government of Upha; 80 miles S. of Upha.—Also, a town of Russia, in the province of Ustiug, on the river Vitchegda; 28 miles S.W. of Yarensk.

VOSPOR, a town of Russia, in the province of Taurus; 112 miles E.S.E. of Perekop. N. lat. 45° 20′. E. long. 36° 26′.

VOSPRESENSKOI, a town of Russia, in the government of Vologda; 44 miles E. of Totma.

VOSSIUS, Gerard John, in *Biography*, was born near Heidelberg in 1577, and perfected himself in the classics, mathematics, philosophy, and theology, at Leyden. Availing himself of a copious library left him by his father, he became director of the college at Dordrecht, where he married twice, and had a numerous family. In 1614, he was appointed director of the college of Leyden, and afterwards professor of eloquence and chronology in the university. By avowing himself favourable to the sentiments of the Remonstrants, he became obnoxious to the Gomarists, and at the synod in Tergou, in 1620, he was deprived of his professorship; but in consequence of the prevalence of Arminianism in England, he obtained the office of prebend in the church of Canterbury. After his return to Holland, he accepted the chair of history in the schola illustris of Amsterdam in 1633, which he occupied till his death in 1649, at the age of 72. The most useful of his writings are two books in Greek and Latin poetry. Among his other works are "De Origine Idololatriæ;" "De Scientiis Mathematicis;" "De quatuor Artibus popularibus;" "Historia Pelagiana;" "Institutiones Rhetoricæ, Grammaticæ, Poeticæ;" "Etymologicon Linguæ Latinæ;" "De Vitiis Sermonis;" "De Philosophorum Sectis." A collection of these were printed at Amsterdam, in 6 vols. fol. 1695.—1701. Moreri.

This learned and laborious author, in his "Theologia Gentili," and other works, frequently speaks of music and has a distinct chapter on the subject in his treatise on the four popular arts, grammar, gymnastics, music, and painting. Yet he tells us little concerning ancient or modern music after the time of Guido; contenting himself with giving definitions of the terms used in the ancient music of the Greeks. He heaps quotation on quotation, telling us how highly the Greeks estimated music; but attempts not to explain any of their doctrines. Like Mr. Bryant, he tries to shake our faith in what antiquity firmly believed. In writing "De Art. Poet. Nat." cap. xiii. he doubts whether Orpheus, Musæus, or Linus ever existed; and rather thinks that these ideal names are derived from the Phœnician language used by Cadmus and his descendants.

Vossius, Isaac, younger son of the preceding, was born at Leyden in 1618, and in consequence of his natural talents, and the advantage of education under his father, acquired early reputation among the learned. Queen Christina, prepossessed by report in his favour, invited him to her court, and acquired under his instruction a knowledge of the Greek language. On the death of his father in 1649, he quitted the court of Christina, and employed himself in the composition of various learned works. In 1670 he visited England, and received the degree of LL.D. at Oxford; and in 1673, he was presented by Charles II. with a canonry of Windsor, and in this situation he passed the residue of his days. His credulity led king Charles to say of him, "that he would believe any thing but the Bible." When he was on his death-bed, he was visited by Dr. Hascard, dean of Windsor, who urged him to receive the sacraments, if not for

for the love of God, at leaſt for the honour of the chapter : he replied, "I wiſh you would inſtruct me how to compel the farmers to pay what they owe me ; that is the ſervice I deſire of you at preſent." Thus diſpoſed, he left the world in February, 1688, at the age of ſeventy. His very valuable library was purchaſed by the univerſity of Leyden. Of his numerous publications the moſt important are the following : "Periplus Scylacis Caryandenſis, et Anonymi Periplus ponti Euxini," Gr. et Lat. cum notis, Amſt. 1639, 4to. "Juſtini Hiſtoria cum Notis," Leyd. 1640 ; "Ignatii Epiſtolæ et Barnabi Epiſtola," Amſt. 1646, 4to. ; "Diſſertatio de vera Ætate Mundi ;" "Pomponius Mela de Situ Orbis," Hagæ, Com. 1658 and 1659 ; "De Septuaginta Interpretibus eorumque Tranſlatione et Chronologia Diſſertationes," 1661, in which he attempted to eſtabliſh the preference of the chronology of the Septuagint to that of the Hebrew text ; which he defended in other tracts ; "De Poematum Cantu et Viribus Rhythmi," Oxon. 1675 ; "De Sybillinis aliiſque quæ Chriſti natalem præceſſere Oraculis," ib. 1679 ; "Variarum Obſervationum Liber," Lond. 1685, 4to. ; "Catulli Opera cum Comment," ib. 1684. Moreri.

He was an enthuſiaſtic and redoubted champion for the muſic of the ancient Greeks, and from his *belle Latinitè* and prejudices in its favour, is more frequently quoted by implicit believers in its perfection, than any other modern who has treated the ſubject.

Voſſius, in his celebrated book "De Poematum Cantu et Virib. Rhythmi," publiſhed 1675, Oxon., ſeems more ready to grant every poſſible and impoſſible excellence to the Greek muſicians, than, when alive, they could have been to aſk. None of the poetical fables, or mythological allegories, relative to the power and excellence of their muſic, put the leaſt violence upon his credulity. A religious bigot, who inſiſts upon our ſwallowing implicitly every thing, however hard of digeſtion, is leſs likely to make converts to his opinions, than he who puts our faith to few trials ; and Voſſius overcharged his creed ſo much, that it is of no authority.

He does not attribute the efficacy of the Greek and Roman muſic to the richneſs of its harmony, or the elegance, the ſpirit, or pathos of its melody, but wholly to the force of rhythm. "As long," ſays he, p. 75, "as muſic flouriſhed in this rhythmical form, ſo long flouriſhed that power which was ſo adapted to excite and calm the paſſions." According to this opinion there was no occaſion for mellifluous ſounds, or lengthened tones ; a drum, cymbal, or the violent ſtrokes of the Curetes and Salii on their ſhields, as they would have marked the time more articulately, ſo they would have produced more miraculous effects than the ſweeteſt voice, or moſt poliſhed inſtrument. In another place he tells us, that "to build cities, ſurround them with walls, to aſſemble or diſmiſs the people, to celebrate the praiſes of gods and men, to govern fleets and armies, to accompany all the functions and ceremonies of peace and war, and to temper the human paſſions, were the original offices of muſic : in ſhort, ancient Greece may be ſaid to have been wholly governed by the lyre."

It appears from this paſſage, and from the tenor of his whole book, that this author will not allow us to doubt of a ſingle circumſtance, be it ever ſo marvellous, relative to the perfection and power of ancient muſic ; the probable and the improbable are equally articles of his belief ; ſo that with ſuch a lively faith, it is eaſy to imagine that he ranks it among mortal ſins to doubt of the ancients having invented and practiſed counterpoint ; and he conſequently ſpeaks with the higheſt indignation againſt the moderns, for daring to deny that they were in poſſeſſion of a ſimultaneous harmony, though, according to him, they uſed it with ſuch intelligence and diſcretion, as never to injure the poetry by lengthening, ſhortening, or repeating words and ſyllables at their pleaſure, nor by that moſt abſurd of all cuſtoms, ſinging different words to ſeveral different airs at the ſame time.

This author's remarks, however, on the little attention that was paid by the compoſers of his time to proſody, merit ſome reſpect. See Rhythm.

VOSTANI, in *Geography*, the middle diviſion of Egypt.

VOSTERMAN, John, in *Biography*, was born at Bommel in 1643, the ſon of a portrait-painter, who taught him the firſt rudiments of deſign, but afterwards he received the inſtructions of Zachtleven. He became renowned for his ingenuity and his vanity. At Paris he aſſumed the ſtyle and title of baron, but ſoon found his honours were too dear to be ſupported. He returned to his native country, and was employed by the marquis de Bethema to paint views on the Rhine, and alſo as a collector of works of art. He came to England in the time of Charles II. and was engaged by the king to paint a view of Windſor ; but was not much employed, and being extravagant, ſoon got into confinement, from which he was releaſed by a contribution from his countrymen.

He accompanied ſir W. Soames on his miſſion to Conſtantinople, intending to take views of all the principal places by the way ; but ſir W. dying on the road, his plan was broken up, and it is not known exactly what became of him afterwards. The ſcenery of his pictures is generally taken from the borders of the Rhine, and painted with chaſte and agreeable colour, and admirable aerial perſpective ; and his figures and ſmall boats are touched with ſpirit and neatneſs.

VOSTISSA, in *Geography*, a town and port of the Morea, containing 800 houſes, churches, and public edifices. This town was almoſt entirely deſtroyed by an earthquake, which took place on the 23d of Auguſt, 1817, and 65 of the inhabitants periſhed in the ruins. Four villages in the neighbourhood were alſo deſtroyed, and the cape at the mouth of the river Gaidouroupniati fell into the ſea, after throwing up a thick ſmoke. The ſea, which at firſt receded to a conſiderable diſtance, leaving the veſſels in the harbour aground, returned with great violence, inundating the land to the extent of half a league.

VOTE, or Voice. See Suffrage, and Voice.

In the houſe of peers, they give their votes or ſuffrages, beginning at the puiſne, or loweſt baron, and ſo to the reſt, ſeriatim, every one anſwering apart, *content*, or *not content*.

In the houſe of commons, they vote by *yeas* and *noes*, promiſcuouſly. See Parliament.

Votes of the houſe of commons firſt began to be printed by a reſolution of the laſt parliament of Charles II. at Oxford, in 1681.

VOTGINSKOI, in *Geography*, a town of Ruſſia, in the province of Uſtiug, on the Sula ; 40 miles S. of Uſt Siſolk.

VOTIAKS, or Votes, a tribe or nation of Finns, ſituated in Ruſſia, upon the river Viætka, in the governments of Viætka and Ufa. They call themſelves Ud or Udi (ſeeming to be the ſame with the Ruſſian Voté), alſo Mord, *i. e.* Man or Udmord. As they live in a great degree ſecluded from other people, their language continues to be a pure Finniſh dialect. They alſo ſtill retain their old diſtribution into ſtems, and give their villages additional names accordingly ; their noble families, however, are partly extinct

extinct and partly mingled with the populace. They were formerly under Tartar protection; but in changing their old masters for the Russian sovereignty, they also quitted their pastoral life for the occupations of settled husbandry, and turned their tents into permanent houses. Their number is not inconsiderable: in the government of Usa, there are about 15,000, and in that of Viætka, 30,000 males. Tooke's Russia, vol. i.

VOTIVE *Medals*, are those on which the vows of the people for the emperors, or empresses, are expressed.

The public vows, made every five, ten, or twenty years, are more often found round the edges of medals, than on the faces of it, at least under the western empire; for in the eastern the case is different: witness the medal of M. Aurelius the younger, where the reverse represents the vows made at the time of his marriage, VOTA PUBLICA. And on Greek medals, ΔΗΜΟΥ ΕΥΧΑΙ, which they sometimes express by the two initial letters, Δ. Ε. according to F. Hardouin's conjecture, which may be admitted in certain medals, where the ΔΗΜ. ΕΞ. that is, ΔΗΜΑΡΧΙΚΗΣ ΕΞΟΥΣΙΑΣ, does not well agree. Witness also the medal of Antonine, VOTA SUSCEPTA DECENNALIA.

The origin of vows, and votive medals, is given by M. Du Cange thus; Augustus feigning himself willing to quit the empire, and having twice, at the prayers of the senate, condescended to hold it for ten years longer, it grew into a custom to make fresh public prayers, sacrifices, and games, for his continuing it, at the ten years' end; and these they called *decennalia*, or *vota decennalia*.

Under the eastern emperors, these vows were repeated every five years: hence it is, that, after Dioclesian's time, we find on medals VOTIS V. XV. &c. which practice continued till the time of Theodosius, when Christianity being well established, a ceremony that had some remains of heathenism in it was set aside. So that the VOTIS MULTIS, on a medal of Majorianus, must be a very different thing; and no other, doubtless, than a kind of acclamation, like that PLURA NATALIA FELICITER.

VOTIVE *Mass*. See MASS.

VOTOKI, in *Geography*, a town of Japan, in the island of Ximo; 25 miles N.W. of Funai.

VOTOMITA, in *Botany*, from *Votomit*, the Indian name of the tree, Aubl. Guian. 90. t. 35. Juss. Gen. 382. See GLOSSOMA.

VOTUM, Vow. See VOW.

VOTUM, in our *Ancient Law Books*, is used for *nuptiæ*, or marriage: so, *dies votorum* is the wedding-day, Fleta, lib. iv. cap. 2. part 16. "Si donatarius ad alia vota convolaverit, &c." See MARRIAGE.

VOUACAPOUA, in *Botany*, the Caribbean name of a tree in Aublet's supplement, p. 10. t. 373, thought by that author the same as the *Andira*, or *Angelin*, of Piso and Marcgrave, in their histories of Brasil, p. 81. of the former, and 100. of the latter. Jussieu, in his Gen. Pl. 363, seems to think both very near to GEOFFRÆA, see that article.

Aublet describes his plant as a very lofty tree, whose trunk is 60 feet, or more, in height, and two feet, at least, in diameter. The wood is yellowish-white, deep red at the heart, which turns black in drying. The head is formed of numerous branches, spreading every way, with alternate, stalked, pinnate *leaves*, composed of from two to four pair of ovate, pointed, entire leaflets, with an odd one, all finely downy beneath, about four inches long and two broad. *Stipulas* in pairs, deciduous. Aublet could never meet with the *flowers*. The *fruit* grows in large clusters, being an obovate bivalve *capsule*, or perhaps *legume*, fleshy when young, dry, but thick and firm, when ripe; externally downy; reddish within. *Seed* solitary, large, oval, with a thin brown skin; its cotyledons firm, whitish, bitter.

The wood is very hard and durable, much used in building and fences. The heart is employed in cabinet-work, and serves even to make pestles and mortars.

VOUAH, in *Commerce*, a long measure at Siam, in the East Indies; which is one inch shorter than the French toise, and therefore measures 6 feet 3⅞ inches English. Two soks make 1 ken; two kens 1 vouah; 20 vouahs 1 sen; 100 sens, or 2000 vouahs, here make 1 league, called roeneng, which is 4204 English yards, or 2⅜ miles nearly.

VOUAPA, in *Botany*, a Caribbean name, Aubl. Guian. 25. t. 7, 8. See MACROLOBIUM.

VOUARANA, a Caribbean name, Aubl. Guian. suppl. 12. t. 374, a tree whose flowers have not come under the inspection of botanists, but whose fruit is an inversely heart-shaped, bivalve *capsule*, with two cells, and a *seed* in each, which is round and smooth. It appears to belong to Jussieu's order of *Sapindi*; but whether most nearly akin, as he supposes, to ORNITROPHE, (see that article,) or to any other genus, we want materials to decide. The tree is of a moderate size, with large alternately pinnate leaves.

VOUCH. A person is said to *vouch for another*, when he undertakes to maintain, or warrant him in any thing, or passes his word in his behalf.

In law, *to vouch*, is to call such a person, or *vouchee*, into court, to make good his warrant.

VOUCHEE, a person who is to warranty, or vouch for another, who, in respect hereof, is called *voucher*. See VOUCHER and WARRANTY.

VOUCHER, in *Law*, the tenant in a writ of right, who calls another person into court, bound to warranty him, and either to defend his right against the demandant, or to yield him other lands, &c. to the value.

This seems in some measure to agree to the contract in the civil law, by which the vendee binds the vendor, sometimes in the simple value of the things bought, sometimes in the double, to warrant the secure enjoying of the thing bought. Yet there is this difference between the civil and common law, in this point, that the civil law binds every man to warrant the security of that which he selleth; which the common law doth not, unless it be specially covenanted.

The process, by which the vouchee is called, is a *summoneas ad warrantisandum*; and if the sheriff return upon that writ, that the party hath nothing by which he may be summoned, then goes out another writ, called *sequatur sub suo periculo*.

A recovery with a *single voucher*, is when there is but one voucher; and with a *double voucher*, is when the vouchee voucheth over, and so a *treble voucher*.

There is also a *foreign voucher*, when the tenant impleaded in a particular jurisdiction, voucheth one to warranty in some other county, out of the jurisdiction of that court, and prays he may be summoned, &c. This were more pertinently called a *voucher of a foreigner*.

VOUCHER also signifies a ledger-book, or book of accompts, in which are entered the warrants for the accomptant's discharge.

VOUDSE, in *Geography*, a town of Arabia, in the province of Hedsjas; 140 miles W. of Medina.

VOVES, a town of France, in the department of the Eure and Loire; 12 miles W.N.W. of Janville.

VOUET, SIMON, in *Biography*, an eminent painter of the French school, born at Paris in 1582, was the son of Lawrence Vouet, a painter of little celebrity. When he was about twenty years old, he accompanied the baron de

Sanſy to Conſtantinople, where he painted from recollection the picture of the grand ſeignior. On his return he ſtaid at Rome, and obtained the patronage of pope Urban VIII. and his nephew the cardinal, by whom he was employed in St. Peter's, and the Barberini palace. Here he reſided 14 years, and was elected head of the academy of St. Luke in 1624.

Louis XIII. appointed him, on his return to Paris in 1627, his principal painter; and employed him munificently in moſt of his palaces. He alſo painted pictures for many churches in Paris. He died there in 1641.

Vouet at firſt was careful and rich in his deſigns and his execution; but as his engagements increaſed in number, he adopted a ſtyle flimſy and even careleſs; fluttered in the parts, and without grandeur in the conception. He is the father of the French ſchool before the revolution, and corrupted the art by its deluſive facility. He was the teacher of Le Brun, Mignard, and others, but had more honour in having trained Le Sueur to the practice of art; who, nevertheleſs, had the ſenſe to aim at the taſte of deſign ſeen in the works of Raffaelle rather than in thoſe of his maſter.

VOUGA, in *Geography*, a town of Portugal, in the province of Beira, on a river of the ſame name; 10 miles E.N.E. of Aveiro.—Alſo, a river of Portugal, which riſes about 15 miles N.E. of Viſeu, and runs into the Atlantic, 5 miles N. of Aveiro, forming a large bay at its mouth, full of iſlands.

VOU-HOUCI, a city of China, of the ſecond rank, in Kiang-nan; 532 miles S. of Peking. N. lat. 31° 22′. E. long. 117° 29′.

VOUILLE′, a town of France, in the department of the Vienne. In 507, near this town, Clovis, king of France, obtained a victory over the Viſigoths, in which their king Alaric was ſlain; 8 miles N.W. of Poictiers.

VOULTE, La, a town of France, in the department of the Ardêche; 11 miles S.S.W. of Valence.

VOUNEUIL SUR VIENNE, a town of France, in the department of the Vienne; 12 miles N.N.E. of Poictiers.

VOURA, a river of European Turkey, which ſeparates Theſſaly from Albania, and runs into the gulf of Arta.

VOURLA, a ſea-port of Aſiatic Turkey, in Natolia, on the ſcite of Clazomene, one of the twelve cities of Ionia. It is built on two eminences, one poſſeſſed by the Turks, the other by Chriſtians, who have about 500 houſes and two churches. The harbour is about a league from the town. The archbiſhop of Epheſus reſides here about three months of the year; there are but very ſmall appearances of its ancient grandeur; 20 miles W. of Smyrna. N. lat. 38° 24′. E. long. 26° 40′.

VOURLOTES, a town of the iſland of Samos; 4 miles N.E. of Carlovaſſi.

VOUSSOIR, VAULT-STONE, or *Key-ſtone*, in *Architecture*, a ſtone proper to form the ſweep of an arch, being cut ſomewhat in the manner of a truncated cone, whoſe ſides, were they prolonged, would terminate in a centre, to which all the ſtones of the vault are directed. See KEY and VAULT.

VOUTE, in *Geography*, a town of France, in the department of the Ardêche, on the right ſide of the Rhône; 18 miles N. of Viviers.

VOUTE, *La*, a town of France, in the department of the Upper Loire; 9 miles S. of Brioude.

VOUTEZAT, a town of France, in the department of the Correze; 9 miles N.W. of Brive.

VOUTIN, a river of China, which riſes in Chineſe Tartary, and runs into the Hoang, 25 miles S.E. of Soui-te, in Chen-ſi.

VOU-TING, or OU-KUEN, a city of China, of the ſecond rank, in Yun-nan; 1145 miles S.W. of Peking. N. lat. 25° 34′. E. long. 102° 20′.

VOU-TING, a city of China, of the ſecond rank, in Chan-tong; 162 miles S.S.E. of Peking. N. lat. 37° 35′. E. long. 117° 19′.

VOUVANT, a town of France, in the department of the Vendée; 6 miles N.N.E. of Fontenay le Comte.

VOUVRAY, a town of France, in the department of the Indre and Loire; 4 miles E. of Tours.

VOUX, a town of France, in the department of the Seine and Marne; 11 miles E. of Nemours.

VOUZAILLES, a town of France, in the department of the Vienne; 12 miles N.E. of Poictiers.

VOUZIERS, a town of France, and principal place of a diſtrict, in the department of the Ardennes; 5 poſts S.W. of Stenay. N. lat. 49° 23′. E. long. 4° 42′.

VOW, VOTUM, a ſolemn promiſe, or offering of a man's ſelf, or other thing, to God.

A perſon is conſtituted a religious, by taking three vows, that of poverty, that of chaſtity, and that of obedience.

Authors are divided as to the antiquity of theſe vows. It is agreed, the ancient anchorets, and hermits of the Thebaid, made none; they did not conſecrate themſelves to God by any indiſſoluble obligation, but were at liberty to quit their retirement, and return into the world, whenever the fervour, that drove them out of it, came to abate.

Vows were not introduced till long after; and that to fix the too frequent inconſtancy of ſuch as, after retiring from the world, repented themſelves too ſoon, or too ſlightly; and by that means ſcandalized the church, and diſturbed the quiet of families by their return.

Eraſmus will have it, that ſolemn vows were not introduced till the thirteenth century, under the pontificate of Boniface VIII. Others hold them to be as ancient as the council of Chalcedon: but the truth is, before Boniface VIII. there were none but ſimple vows, and ſuch as might be diſpenſed withal. Their vows, till that time, were not deemed eternal chains; they were not indiſſoluble. It is true, they were obligatory promiſes, as to conſcience; and the inconſtancy of ſuch as violated them was held an odious deſertion: but, as to the law, the perſons were not held to be civilly dead, ſo as, upon their return, to render them incapable of all acts of civil ſociety.

The moſt common vow was that of poverty, but this only regarded the convent; on account of which, every perſon diveſted himſelf of all property: but the making of vows did not at all exclude them from the rights of blood, or render them incapable of inheriting.

No religious, it is true, acquired the property of the effects that fell to him; they all belonged to the monaſtery, in favour of which he had diveſted himſelf of every thing; and the monaſtery only left him the uſufruit and direction of them. The popes have frequently confirmed this privilege to divers orders, and permitted the monks to inherit, as much as if they were ſeculars, and had made no vows.

At preſent, the civil death of a religious is dated from the day he makes the vows; and from that time he is utterly incapable of inheriting. A religious may reclaim, or proteſt againſt his vows within five years; but, after that, it is no longer admitted. The failures in the profeſſion are eſteemed to be purged, by his ſilence and perſeverance for five years. Indeed, to be relieved from his vows, it is not enough

enough the party reclaim within the five years; but he must likewise prove that he was forced to take the habit.

Vows, *Vota*, among the *Romans*, signify sacrifices, offerings, presents, and prayers, made for the emperors and Cæsars, particularly for their prosperity, and the duration of their empire.

These were, at first, made every five years, then every fifteen, and then every twenty, called *quinquennalia, decennalia*, and *vicennalia*.

In divers antique medals and inscriptions, we read, *Vot.* X. *Vot.* XX. *Vot. mult.* signifying *votis decennalibus, vicennalibus, multis*, &c. See Decennalia.

Vows, in a moral and religious sense, are promises to God; and therefore, according to archdeacon Paley, the obligation cannot be made out upon the same principle as that of other promises. The violation of them, nevertheless, implies a want of reverence to the Supreme Being; which is sufficient to make it sinful. There appears no command or encouragement in the Christian scriptures to make vows; much less any authority to break through them when they are made. The few instances of vows which occur in the New Testament were religiously observed. (See Acts, xviii. 18. xxi. 23.) The rules that pertain to promises are applicable to vows. Thus Jephthah's vow, taken in the sense in which that transaction is commonly understood, was not binding; because the performance, in that contingency, became unlawful. From this and other instances, it appears that rash vows are not only imprudent, but culpable. See Promise.

VOWEL, Vocalis, in *Grammar*, a letter which affords a complete sound of itself, or a letter so simple, as only to need a bare opening of the mouth to make it heard, and to form a distinct voice.

Such are *a, e, i, o, u*; which are called *vocales*, vowels, in contradistinction to certain other letters, which, depending on a particular application of some part of the mouth, as the teeth, lips, or palate, can make no perfect sound without an opening of the mouth, that is, without the addition of a vowel; and are therefore called *consonants*.

Though we ordinarily only reckon five vowels, yet, besides that each of these may be either long or short, which occasions a considerable variety in the sound; if we consider only their differences resulting from the different apertures of the mouth, we might add four or five more vowels to the number. For the *e* open, and the *e* close, are different enough to make two vowels, as in *sea*, and *depth*; so also the *o* open, and *o* close, in *host*, and *organ*. Add, that the *u* pronounced *ou*, as the Latins did, and as the Italians and Spaniards still do, has a very different sound from the *u*, as pronounced by the Greeks, and, as at this day, by the English and French. Again, *eo*, in *people*, make but one simple sound, though we write it with two vowels.

Lastly, the *e* mute is, originally, no more than a surd joined to a consonant, when that is to be pronounced without a vowel, as when it is immediately followed by other consonants. This is what the Hebrews call *scheva*, especially when it begins the syllable: and this *scheva* is found in all languages, though overlooked in many of them, particularly in the English, Latin, &c. by reason it has no proper character to denote it; though, in some of the vulgar tongues, particularly French and High Dutch, it is expressed by the vowel *e* adding its sound to the rest.

Thus, without regarding the differences of the same sound or vowel, as to length or shortness, one may distinguish ten several vowels, expressed by the following characters, *a, e, é, i, o, ó, eu, ou, u, e* mute.

To these we may add *y*, which, as the learned Dr. Lowth observes, is formed by the opening of the mouth, without any motion or contact of the parts, and has every property of a vowel, and not one of a consonant. Lowth's Gram. p. 20. n. 1.

Mr. Sheridan, who makes the number of simple sounds in our language to be twenty-eight, reckons nine vowels,

a, a, a, e, o, o, e, i, u.

viz. hall, hat, hate, beer, note, noose, bet, fit, but. Rhet. Gram. p. 9.

Vowel-*Points*, in the *Hebrew Language*. See *Vowel-Points*.

VOX, in *Law*. *Vocem non habere*, is a phrase used by Bracton and Fleta for an infamous person; one who is not admitted to be a witness.

Vox *Humana*, Lat., *Voix Humaine*, Fr., a stop in the organ; thus named from its being an imitation of the human voice. It is a reed stop, in unison with the open diapason: it is a short metal pipe, of a wide globular form at the top, resembling a human mouth. This is a celebrated stop in the famous organ at Haerlem; in hearing which we were somewhat disappointed, as it does not at all resemble a human voice, though a very good stop of the kind. But the world is very apt to be imposed upon by names. The instant a common hearer is told that an organist is playing upon a stop that resembles a human voice, he supposes it to be very fine, and never inquires into the propriety of the name, or exactness of the imitation. However, with respect to our own feelings, we must confess, that of all the stops which we have yet heard, that have been honoured with the appellation of *vox humana*, no one, in the treble part, has ever reminded us of any thing human, so much as the cracked voice of an old woman of ninety; or, in the lower notes, of Punch singing through a comb.

VOXTORP, in *Geography*, a town of Sweden, in the province of Smaland; 29 miles N.W. of Wexio.

VOYAGE, denotes a journey by sea.

VOYAL, a large rope formerly used to unmoor or heave up the anchor of a ship, by transmitting the effort of the capstan to the cable; but mostly used when the fore-jeer capstan was employed for this purpose. The voyal reeved through a large block lashed to the main-mast, and then communicated to the fore-jeer capstan: but messengers are now chiefly used instead of it.

Voyal, *Shifting the*. See Shifting.

VOZ, in *Geography*, a lake of Russia, in the province of Novgorod, about 60 miles in circumference. N. lat. 60° 30′. E. long. 38° 54′.

VOZGA, a town of Russia, in the government of Novgorod, near lake Voz; 48 miles N.N.E. of Bielozersk.

VOZIA, a town of European Turkey, in Bessarabia, on the Black sea; 26 miles W. of Otchakov.

VOZNESENSKOI, a town of Russia, on the Angara; 20 miles N.N.W. of Irkutsk.

UPA, a river of Russia, which rises near Epiphan, passes by Tula, and runs into the Oka, near Lichvin, in the government of Kaluga.

UPAIX, a town of France, in the department of the Higher Alps; 11 miles S.E. of Serres.

UPANEMA, a river of Brasil, which runs into the Atlantic, S. lat. 4° 30′. W. long. 37° 32′.

UPATCHAWANAN, or Temiscamain, a settlement in Canada. N. lat. 47° 17′.

UPBO, a town of Sweden, in Dalecarlia; 20 miles S.S.E. of Fahlun.

UPELLA, a town of Hindoostan, in Golconda; 18 miles N.N.W. of Warangole.

UPELLA *Chanderaghery*, a town of Hindooftan, in Golconda; 16 miles N. of Warangole.

UPENDRA, a name of the Hindoo deity Vifhnu. (See VISHNU.) It has been fuppofed to imply inferiority to Endra, or Indra, the regent of the firmament. See INDRA.

UPHA, in *Geography*, a town of Ruffia, and capital of a government, on the Bielaia; 452 miles W.S.W. of Tobolfk. N. lat. 54° 35'. E. long. 56° 2'.—Alfo, a river of Ruffia, which runs into the Bielaia, at Upha.

UPHIMSKOI, a government of Ruffia, of a triangular form, bounded on the north by the governments of Perm and Viatka; on the weft by the governments of Caucafus, Saratov, Simbirfk, and Kazan, the part immediately fouth by the Cafpian fea, and the part immediately eaft by the government of Tobolfk; to the north it extends from eaft to weft about 440 miles, and to the fouth from eaft to weft only 64; weftward from north to fouth it meafures about 520, eaftward only 160. In this government is a famous mine of falt, fituated near the river Ilek. The falt of this pit is moft beautiful, and of the beft quality. It is taken from a kind of rock about four verfts from the river. The length of the rock is 800 fathoms, and the breadth about 500. It is fo folid, that it has not yet been poffible to found it. With a miner's wimble, however, they have penetrated to the depth of 27 fathoms; but time and inftruments have not afcertained a complete knowledge of the depth of this mafs. From 1784 till 1787, more than 30,000,000 pounds of falt were taken from this rock, and tranfported into different parts of the empire, by the Volga, the Bielaia, and the Kama. This falt is fold in the country at 25 or 30 copecks the pood, which is about a halfpenny the Englifh pound. It is calculated that this pit may yet furnifh falt for near two centuries, fuppofing the depth to be no greater than it is already known to be. In order to render the working more productive, and lefs expenfive, the government has lately made an agreement with fome Coffacks, who are to dig 50,000 poods a year, and tranfport them to the magazines of Orenburg. There are in the neighbourhood of this pit fome very deep lakes of falt water, to which great virtue is affigned by the Kirghis, and in which they bathe of their own accord, when afflicted with the leaft difeafe. Their phyficians, who have had an opportunity of judging of thefe baths, all agree, that they are good for all pedicular difeafes. There is one aftonifhing circumftance attending thefe waters, namely, that their furface is as cold as ice, while the deeper you plunge, the warmer you become; at the bottom it is faid no perfon can ftay more than two or three feconds. N. lat. 47° to 56°. E. long. 50° to 64°.

UPHOLDER is ufed in the fame fenfe with undertaker, as the denomination of a tradefman who provides for funerals.

UPHOLDER, or *Upholfterer*, denotes alfo a perfon who furnifhes houfes, fitting up apartments with beds, and other furniture. See APPRAISER and BED.

UPIERCWIZA, in *Geography*, a town of Lithuania; 33 miles E. of Minfk.

UPINGE, a kind of fong confecrated to Diana by the Greeks. Rouffeau.

UPINISHAD, or UPANISHAD, in *Hindoo Literature*, is the title of a portion of their fcripture comprifed in the Veda. Each Veda contains feveral portions, bearing this common denomination. On thefe Upanifhads the whole of the Indian theology, efpecially the Vedanta theory, is profeffedly founded. See VEDA and VEDANTA.

The proper meaning of the word Upanifhad, according to Mr. Colebrooke (Af. Ref. vol. viii. art. 8.), is "divine fcience, or the knowledge of God; and it is equally applicable to theology itfelf, and to a book in which this fcience is taught. The fenfe properly deducible from its etymology invariably points to the knowledge of the divine perfections, and to the confequent attainment of beatitude, through exemption from paffions."

The word, by fome writers, has been thought to mean fomething hidden or myfterious; but Mr. Colebrooke fays, that "neither the etymology nor acceptation of the word has any direct connection with the idea of fecrecy, concealment, or myftery." (Ib.) It feems rather indeed to mean *revelation*. In the curious article above referred to, a lift of the Upanifhads is given; with much important and interefting information refpecting them, and the extraordinary volumes through which they are interfperfed. An extract from it is given under our article MUNI.

UPLAND, in *Geography*, a province of Sweden, bounded on the north by the gulf of Bothnia, on the eaft by the Baltic, on the fouth by the Mælar lake, and on the weft by Weftmanland; about 75 miles in length from north to fouth, and where wideft, 55 from eaft to weft. It is fertile in corn, and the lakes and rivers abound in fifh. Some of the beft iron-mines of Sweden are found in this province. Stockholm is fituated in Upland.

UPLAND, or *Upland Paftures*, in *Agriculture*, all fuch land and paftures as are fituated in a high elevation, or which are much expofed in confequence of the height to which they are raifed above the other furrounding grounds. Such land and paftures are moftly found particularly ufeful in fome forts of hufbandry and farming, as thofe of the fheep kind, as they are commonly hard, firm, and dry, during the winter and more wet feafons of the year, when this fort of ftock is moft in danger in many fituations.

In the northern parts of the ifland, the extenfive highland tracts of thefe lands and paftures are for the moft part converted to the purpofe of fheep-walks; in which management they are fuppofed by many to be by far the moft advantageous. But fome have lately fuggefted that black cattle and planting may be combined with thefe, fo as to afford a ftill greater benefit. The Rev. Mr. Singers, in an able effay in the third volume of the Tranfactions of the Highland Society of Scotland, has remarked on the upland and pafture fheep-farming of that diftrict, that "it has not yet been clearly afcertained what effects the introduction of fheep hufbandry into the Highlands has really produced, or how far that mode of farming ought to be carried," or is proper; neither has it been accurately determined, it is faid what forts of fheep are adapted to the refpective fheep-walks in that extenfive tract of upland and pafture. It is a point, too, ftill undecided, how far fheep and black cattle are confiftent as joint or feparate ftocks, on the fame upland farm; and which of them is entitled to the preference, to a certain extent; or whether the proper extent can be pointed out. Doubts alfo are entertained in refpect to foreft trees, how far it is proper to attend to the rearing of them, on farms producing fheep as the ftaple article; and that a fimilar queftion has been put, whether it is profitable to cultivate any part of the foil, when flocks of fheep are fed in the neighbourhood, and under the difadvantages of a climate very moift and uncertain?

It is fuppofed that thefe points lie at the foundation of the profperity of the upland or Highland tracts of the country; and that, of courfe, they are clofely connected with the general profperity of the Britifh empire: it will confequently be admitted, that every thing is of importance which may tend to throw a ray of light upon any one of them.

them. In this intention, this view of a comprehensive system of husbandry, which has been had recourse to with great success by intelligent individuals, in a soil and climate greatly resembling those of the uplands and pastures of the Highlands; sheep, it is said, are unquestionably to be considered as the staple stock over the Highlands of Scotland; but to rear sheep as the sole produce of the soil is, it is thought, an error of the worst kind. It was naturally to be expected, that when sheep were introduced upon these uplands, and found to be a safe and profitable sort of stock, they would probably go too far, before the true balance should be found. But it is capable of being established, it is said, on reason and clear testimony, that woods, cattle, and cultivation, judiciously managed, are friendly to sheep, on such uplands, in the highest degree; while the solid interests, comforts, and benefits of society are greatly promoted by a proper intermixture of them all in such cases.

The effects of sheep-farming on these uplands are, it is observed, first, a great rise in the rents, which is not, however, to be wholly imputed to sheep, but many other causes. The true light in which the superiority of sheep, in such cases, is to be considered, is, it is said, that by means of them a farmer can pasture a large extent of inaccessible grass land, not safe for black cattle; that he can maintain a stock, with less danger of heavy losses by famine, in winter and spring; and that sheep, as a stock, are managed at less expence, and are more marketable than any other. It is conceded indeed, that, by means of goats, the most rugged pasturage might be consumed; but these animals, in point of flesh, as well as coat, would be a wretched substitute for sheep in such cases, in any market whatever. It must be allowed by all, that a flock of sheep enables the farmer to occupy a larger portion of the soil than he could do by a stock of black cattle; that sheep, too, are more adapted to the greater part of an extensive and rugged upland farm than any sort of black cattle; that a fuller stock of them may be safely put on the grounds, without incurring so much risk of famine; and that no stock is easier managed, or more marketable. These are important considerations; and they are decisive in favour of sheep, as the principal article, it is supposed, over the uplands of the Highlands, that a farm can produce.

Secondly, a valuable supply of wool has been furnished the country, from the upland pastures of the Highlands; that though most of such wool is coarse, and that wool has not declined in price in consequence of this large accession to the trade, it must be remembered that coarse wool was the article most wanted by manufacturers; and also, that many large upland tracts of the Highlands are well adapted to rear fine wool, when the farmers shall find it their interest to follow that plan. And in regard to the increased price of wool, it may be asked, it is said, what must have been the prices, or where the manufacturers must have looked for it, if there had not been any raised on the uplands of the Highlands of late years? Probably, it is supposed, the distinguished success of that capital branch, the woollen trade, may have depended in no small degree on the vast supplies of wool from that quarter.

Thirdly, the reduction of the numbers of black cattle must inevitably, it is believed, follow the introduction of sheep, and also the reduction of the extent of cultivated grounds. But it does not of necessity, it is said, follow, that black cattle and culture should be altogether abandoned. There is a good medium in these matters, it is supposed, which is safer than either extreme. To people not well acquainted with the economy of a productive system, embracing sheep as the principal article, and a proper number of cattle, and extent of cultivation, it may appear to be the easiest expedient to lay the whole of their farms into sheep-wastes: but more experienced farmers would, it is thought, smile at the pretence which want of skill has so often advanced for going into this most injudicious extreme; well knowing that every intelligent store-master calculates on rendering his sheep much better, and insuring their safety in a greater degree, by means of judicious cultivation. It is therefore to be observed, that the banishment of black cattle and of culture out of the upland sheep-farms in the Highlands are effects which do not necessarily follow the introduction of sheep, but have arisen from an inconsiderate extreme, the result of error and want of experience in the established modes of sheep management, especially on such uplands.

Fourthly, depopulation is the worst effect, it is said, which has followed the introduction of sheep husbandry on the uplands and pastures in the Highlands. It is, however, undeniably the fact, that such an effect has been produced, and that to a great extent. But it cannot be so readily admitted, it is thought, that this effect was necessarily connected with the sheep husbandry; for it arose more properly from the total neglect of culture, and of black cattle, than from the change of stocks. It is asked, if we find that the sheep stocks of England, or of the south of Scotland, necessarily occasion depopulation? If a due proportion were maintained on such lands of the Highlands, between sheep and other important articles, such as cattle, corn, green crops, and inclosures and plantations of trees, to say nothing of the fisheries, the roads, and other public matters, employment would, it is supposed, be furnished for the inhabitants, at least as ample and productive as they ever possessed, when black cattle were their stock, and a proportion of goats, instead of sheep. But the truth is, it is said, that unfortunate circumstances of a complicated nature combined in depopulating the Highlands, when sheep were introduced, as are fully shewn in the Essay, to which we must refer the reader.

Still, however, the sheep system is thought to be right upon these uplands; and though it may have gone to an extreme, it was what was to be dreaded and expected. To that extreme, and not to the nature of the stock introduced, ought, it is supposed, to be imputed most of the evils complained of; while the beneficial effects of sheep husbandry on such uplands appear to be necessarily connected with it, and therefore to give it a steady and well-founded superiority. The evils of it may, it is thought, be obviated or counteracted by judicious management; and that sheep, as the principal article of produce, are entitled to an evident preference over the whole of the uplands and pastures of the Highlands; but that, at the same time, it is unwise and impolitic in every view to make them the sole produce on the lands.

In these upland tracts nature seems, it is said, to have laid out extensive sheep-walks on almost every farm; and that as it is found that sheep are the safest stock, the most easily and cheaply managed, having access to the largest part of the pastures, and always marketable and productive to the farmer, it is undeniable, the writer supposes, that they should be reared as the main article of farm produce throughout the upland tracts of the Highlands. But it can never be admitted, it is thought, by any man of sense, that this immense district should be turned wholly into a sheep-waste. Other articles of produce succeed as well as sheep, and should be reared to a proper extent: some are essential to the comforts, and even subsistence of the inhabitants; while they return as ample profits as sheep, and are of exceedingly great value to the sheep-stocks; not to mention their

their importance in other respects. If the sheep husbandry of these tracts, instead of engrossing all the attention of the farmers, and all the soil, were to be considered as the chief article, but at the same time intermixed with a due proportion of black cattle, of corn, and of green crops; and if proprietors would also introduce into the system judicious plantations of forest trees, incalculable advantages would certainly, it is thought, be obtained. This beautiful system, it is said, is not ideal. It is found by experience to be admissible in every point of view; comfort, beauty, and profit, going hand in hand.

The peculiar advantages of black cattle, the culture of corn and green crops, and the planting of forest trees, in connection with sheep, on these uplands and pastures, are then particularly pointed out and explained, when the writer suggests the proper sort of management for the sheep and the black cattle that should be pursued in such cases, and shews the comparative value of each in a very clear manner; concluding by observing, that all these branches are mutually subservient to each other: all of them are adapted, each on its own scale, to the climate and the soil of the country; and that they all contribute to the solid comforts and prosperity of the people in all stations, the proprietors, the farmers, and the people at large. These upland tracts are laid out, it is said, for pasturage by the hand of nature, and sheep are the true staple: but the country is likewise naturally laid out for every part of the mixed husbandry that has been advised above; all the necessary materials abounding; and every part, like the links of a golden chain, being connected with, and depending on one another. Cattle alone are not, and cannot, it is said, be a safe stock; sheep reared exclusively turn all into a waste. Trees, if suffered to overspread the country, would convert it into a wilderness; and cropping on a large scale is more than hazardous, it is impracticable. The mixed system is, therefore, the most proper and beneficial for such tracts, in many different points of view. See the paper.

In some of the southern parts of the kingdom, too, the uplands and pastures are found very beneficial in the supporting of sheep-stock. In the Romney-Marsh system of sheep management, it is the usual practice to send the lamb-stock in the beginning of the autumn, in vast quantities, to be supported and kept by the hill or upland farmers in the neighbourhood, through the winter, which is found to answer well under proper care and attention.

In the South-Down, and other upland districts, the high grounds and pastures are likewise mostly occupied with sheep as a principal stock, to the greatest advantage. See Sheep.

The uplands and pastures in many parts of the country are, however, in a very indifferent and unprofitable state, from the want of suitable manuring, feeding, and stocking, whatever may be the purpose to which they are applied. See Pasture and Pasture-*Land*.

UPLOPER, a name given to one particular species of pigeon, called by Moore, *columba gutturosa saliens*.

It was first brought to England from Holland, and much resembles that kind of pigeon called the English powter, but that it is smaller. Its crop is very round, and in this it buries its bill. Its legs are very small and slender, and its toes are short, and close together, on which it treads so nicely, that when moving, any small thing might be put under the ball of its foot. The pigeons of this species are generally all blue, all black, or all white; seldom or never pyed. They are very scarce in England, and in Holland have been valued at five and twenty guineas a pair.

They have their name from the Dutch word *oplopen*, which signifies to leap up, and it was thus named from its manner of approaching the hen, which is always by leaping upon her. Moore's Columbarium, p. 67.

UPNOR Castle, in *Geography*, a fortress of England, in the county of Kent, on the left bank of the Medway, near Chatham.

UPPARAH, a town of Hindoostan, in the circar of Rajamundry; 30 miles E. of Rajamundry.

UPPER Deck, in a *Ship*, the highest of those decks which are continued throughout the whole of a ship of war, or merchantman, without any interruption of steps or irregular ascents.

Upper-*Breadth Sweeps*, in *Ship-Building*, the centre of which is in the line representing the upper height of breadth of the timber. This sweep, described upwards, forms the lower part of the top-timber. See Ship-building.

Upper *Height of Breadth*, the upper curved line on the sheer plan, describing the greatest height of the main-breadth or broadest part of the ship at each timber. See Ship-building.

Upper *Strake*, in *Boats*, a strake thicker than those of the bottom, wrought round the gunwale.

Upper *Works*, in *Naval Architecture*, a general name given to all that part of a ship which is above the surface of the water when she is properly balanced for a sea voyage: or it is that part which is separated from the bottom by the main wale.

Upper *Hemisphere*, *Ocean*, *Polar Dial*, and *Region*. See the substantives.

Upper *Slope of a Canal*, is the face of the bank K P (*Plate* I. *Canals*, *fig.* 3.) in side-laying ground; or A B and K P (*fig.* 6.) in deep-cutting.

Upper *Lake*, in *Geography*, a lake of Ireland, in the county of Kerry, 4 miles from Lough Lane, with which it communicates by a river, which runs between Torc mountain and Gleenaa mountain.

UPPINGHAM, a market-town in the hundred of Martinsley and county of Rutland, England, is situated 6 miles S. by E. from Oakham, and 89 miles N.N.W. from London. It is considered as the second town in the county, and in some respects superior to Oakham, the county-town: the streets are well paved; the houses, which in general are well built, are disposed in the form of a square, with one long street leading to the west end. The church, which stands on the south side of the square, has a lofty spire, and the church-yard commands an extensive prospect: it also contains some well-executed monuments, particularly one of the date of 1653, in honour of Everard Fawkener, esq., who had been sheriff of the county, and was a great benefactor to the town, having paved the streets at his own expence. Adjoining to the church-yard is a free-school, founded on a very extensive plan, for general education, and even for the preparing of youth for the universities. It was built about the year 1584, by the Rev. Robert Johnson, archdeacon of Leicester, who was also the founder of a similar institution at Oakham. The expences of the erection were defrayed partly from his own purse, assisted by the produce of concealed church lands which he begged from queen Elizabeth. It is a plain neat edifice, and has over the door, in Hebrew, Greek, and Latin, "Remember thy Creator in the days of thy youth." Here is also an hospital, built at the same time, and out of the same funds, by the benevolent archdeacon, for the maintenance of thirteen poor men and one woman. A weekly market and an annual fair were granted in 1280 by Edward I., to Peter de Montfort, then lord of this manor, and his heirs for ever, with the express provision that the fair should not operate to the detriment

detriment of any fair of older date in the vicinity: the market-day is Monday, and here are now two fairs yearly, for horses, cattle, sheep, coarse linen, homespun cloth, &c. This town has the privilege, by grant of 11 Henry VII. to keep the standards of weights and measures for the county. In the return of the year 1811, the population of Uppingham was stated to be 1484, inhabiting 292 houses.—Beauties of England and Wales, vol. xii. Rutlandshire.

UPRIGHT, in *Architecture*, a representation or draught of the front of a building; called also an *elevation*, or *orthography*.

UPRIGHT, in *Heraldry*, is used in respect of shell-fishes, as crevices, &c. when standing erect in a coat. Inasmuch as they want fins, they cannot, according to Guillim, be properly said to be *hauriant;* that being a term appropriated to scaly fishes.

UPRIGHT, in *Sea Language*, the position of a ship when she neither inclines to one side nor to the other. Hence any thing is said to be upright when square with, or perpendicular to the keel.

As the ship when building lies with a declivity for the purpose of launching, it is evident that every thing within her intended to be upright when a-float, must be set square from the inclination of the ship.

UPRIGHT, *Cape*, in *Geography*, a cape on the E. end of Gore island, in the North Pacific ocean. N. lat. 60° 30′. W. long. 172° 13′.—Also, a cape in the straits of Magellan. S. lat. 53° 6′. W. long. 75° 38′.

UPRIGHT *Bay*, a bay near the western extremity of the Straits of Magellan. S. lat. 53° 8′. W. long. 75° 35′.

UPRIGHT *Bent-Grass*, in *Agriculture*, a sort of this kind of grass, which is found, by the trials made at Woburn under the direction of the duke of Bedford, to afford at the time the seed is ripe, on a soil of the boggy sort, upwards of 7486 pounds weight of grass upon the acre, which, when dry, weighed more than 2713 pounds, and which lost in the operation of drying about 4772 pounds. The quantity of nutritive matter that is afforded by it, is about 175 pounds on the same space of land. See AGROSTIS *Stricta*.

It seems not to be a grass of any great value to the farmer.

UPRIGHT *Perennial Broom-Grass*, a sort of this kind of grass, which has been found, at the time of flowering, on a rich sandy soil, to produce 12,931, and rather more, pounds of grass on the acre, which weighed when dry about 5819 pounds, and which lost in drying 7112 pounds and rather more. It is a grass that affords nutritive matter about 555 pounds on the same space of ground. See BROMUS *Erectus*.

UPRIGHT *Goose-Grass*, a noxious weed of the perennial kind, often met with in meadows and wet pastures, in different districts and parts of the country.

UPRIGHT *Mat-Grass*, a kind of grass, which, at the time the seed is ripe, is found to produce, on the acre, 6125 ten pounds, which weighs in the dry state 2450 4, and which loses in drying 3675 6 pounds. It affords 215 5 10 pounds of nutritive matter on the same space. See NARDUS *Stricta*.

UPRIGHT *Sea-Lyme Grass*, a sort of grass, that, at the time the seed is ripe, produces from the acre of clayey loam soil 43.560 pounds, which weigh when dry 24,502 8, and which loses by drying 18,957 8 pounds. The quantity of nutritive matter afforded by the same space of land, is 3403 pounds and rather more. See ELYMUS *Arenarius*.

UPRIGHT *Screw Cheese-Press*. See WINDING *Screw Cheese-Press*.

UPSAL, or UPSALA, in *Geography*, a city of Sweden, in the province of Upland, situated on an open plain fertile in grain and pasture, is a small but neat town, containing, says Coxe, exclusively of the students, 3000 inhabitants. The ground plot is very regular: it is divided into two almost equal parts by the rivulet Sala, and the streets are formed at right angles from a central kind of square. Some of the houses are built with brick, and stuccoed; but they are generally constructed with trunks, smoothed into the shape of planks, and painted red, and the roofs are covered with turf. Each house has a small court-yard or garden. Old Upsala is a place of high antiquity, and is supposed to have stood at a small distance from the scite of the present town. In times of Pagan superstition it was much celebrated as the principal place of sacrifice, and as the residence of the high priest of Odin. New Upsala is anterior to the foundation of Stockholm, and is said to have been a suburb of Old Upsala, and to have risen on its ruins. Upsala was formerly the metropolis of Sweden, and the royal residence. Its ancient palace, begun in 1549, by Gustavus Vasa, and completed by his son Eric, was a spacious and magnificent edifice until the year 1702, when great part of it was consumed by fire. What remains of it commands, on account of its elevated situation, a fine prospect of the adjacent country; and its principal front, which has been repaired, is covered with a red stucco. Many traces are still left of its ancient splendour. The few remaining apartments in the ruined wing are used as a common gaol. Under it are three dungeons, formerly appropriated to the confinement of state-prisoners, the most remarkable of whom was count Svante Sture, of an ancient family, which before the election of Gustavus Vasa had the fairest pretensions to the throne. The extinction of this family was owing to the madness of Eric, who, in the year 1567, murdered both count Svante and his son Nicholas. After this frantic and cruel deed, he wandered about the woods in a state of remorse and distraction, until at length, being discovered by his wife, her presence restored him to a temporary possession of his understanding. However he soon relapsed, and his government became so odious, that in the following year he was deposed by his two brothers, and John ascended the throne.

Upsala is an archiepiscopal see, and one of the most ancient Christian establishments in Sweden. The first bishop was Everinus, an Englishman, who in 1026 visited Sweden, at the request of king Olaus Scotkonung, to assist in converting the natives of Old Upsala to Christianity. His successors in the see resided for the most part at Sigtuna, until the year 1120, when Nicholas Ulphson fixed the residence at Old Upsala. The first archbishop was Stephen, a native of East Gothland, and he was elevated to that dignity in 1164, and died in 1185. Falke, who was consecrated in 1267, first transferred the residence to New Upsala, in the year 1273. The first Protestant archbishop was Laurentius Petri of the province of Nerike, who in conjunction with his brother Olaus Petri first preached the reformed doctrines to the Swedes, and translated the Bible into his native tongue. He died in 1570. In the sacristary of the cathedral are several ancient relics; one of which is a log of wood, carved into a figure that rudely resembles a human head, called the image of Thor, formerly worshipped in these parts, and to whom human sacrifices were offered at Old Upsala. The kings of Sweden were formerly crowned in this cathedral; but the last sovereign who was inaugurated at Upsala was Ulrica Eleonora. Upsala is celebrated for its university, which is the most ancient in Sweden. In 1246 Birger Jarl established a school at this place, and in 1478 Steno Sture, law administrator of Sweden, laid the first foundation of the university; the plan of which had been formed, but not executed, by Eric of Pomerania; its regulations being modelled after those of Paris. The institution was confirmed in

in a diet which met at Strængnæs on the 2d of July; and the university was opened with due ceremony on the 7th of October. It was warmly patronized by Gustavus Vasa, and liberally endowed by him, so that he has been regarded as its second founder. Under John III. it was removed to Stockholm, but restored to Upsala by Charles IX. After declining for some time, it was revived by Gustavus Adolphus, who constructed a large building at his own expence, and endowed it with his patrimonial estate of Vasa. His example was followed by his successors and by various individuals; so that the number of scholars has considerably increased. At the head of the university is a chancellor, chosen by the professors and confirmed by the king. The presidency devolves by rotation on one of the professors, styled "Rector Magnificus." The university has its own court of justice, called "Consistorium Minus," for the trial of the students and dependants. From this court an appeal lies to a "Consistorium Majus." The number of professors is about twenty-four, of whom the principal are those of divinity, eloquence, botany, anatomy, chemistry, natural philosophy, astronomy, and agriculture. Students are admitted into the university at the age of sixteen, for the completion of their academical studies. They do not inhabit, as in our universities, any distinct colleges, but lodge in the town, and repair to the lectures of the professors, either at their houses or at the public halls. The poorer students are assisted by scholarships, called "stipendia," some founded by the crown, others by private persons; the common degrees granted by this university are "Philosophiæ Candidatus," corresponding to bachelor of arts, and "Philosophiæ Magister," answering to master of arts. In order to obtain the first of these degrees, he candidate undergoes several previous examinations, and composes a Latin thesis. His exercises for the second, are a Latin thesis, holding a public disputation, and reading a lecture in the same language. There is no academical discipline. Although the students have no regular dress, yet on some occasions, as when they take a master's degree, they appear in a black silk cloak, which they ought also by the statutes of the university to wear when they keep their acts. The professors, on days of ceremony, are clad in black cloaks, the doctors of divinity are distinguished by a hat of black silk, the doctors of law by one of white, and those of physic by one of green or sky-blue. The number of students varies, but has been stated at an average of ten years at 500. This university, styled by Stillingfleet, "that great and hitherto unrivalled school of natural history," has produced persons eminent in every branch of science. The library contains many valuable books and MSS. This owes its origin to Gustavus Adolphus. Among the most valuable pieces of literary curiosity is a manuscript of the four gospels, called from its silver letters CODEX *Argenteus*, which see.

The Royal Society at Upsala, the oldest literary academy of this kind in the North, took its rise in 1720. At first it consisted of a number of learned men, who published reviews of books, under the title of "Acta Literaria Sueciæ;" but in 1730 the transactions of the society consisted of original acts and dissertations; and when patronized by the king, it assumed the name of "Societas Regia," and the transactions, published annually, were denominated "Acta Literaria et Scientiarum Sueciæ." In 1740, it was called "Societas Regia Literaria et Scientiarum Upsaliensis," thus distinguished from the Academy of Sciences at Stockholm, which was denominated "Academia Regia Sueciæ." In 1750 their publications ceased, but they were again renewed in 1772, under the title of "Nova Acta Regiæ Societatis Scientiarum Upsaliensis." They are written in the Latin tongue, and printed in 4to. The original numbers issued from 1720 to 1750 are comprised in six volumes.

The place where the ancient kings of Sweden were elected lies about seven miles from the town of Upsala, and is still marked by mutilated stones, one of which is called "Morasteen," or the stone of Mora; on which the sovereigns were enthroned with due solemnity, and received the homage of their subjects. Olaus Magnus relates that the Morasteen was placed in the middle of twelve other stones in a circle. A similar monument near the village of St. Buriens, in Cornwall, is described by Camden. The botanical garden of Upsala is small, but laid out with judgment, and the collection of exotics is numerous. Upsala is 45 miles from Stockholm. N. lat. 59° 51′. E. long. 17° 26′.

UPSARA, in *Hindoo Mythology*, is the name of a poetical race of water-nymphs, proverbial for their beauty and fascinations. They are the dancing girls of Indra's court, answering to the fairies of the Persians, and to the damsels called in the Koran *Huruleyun*, or with antelopes' eyes. The name has been derived from *up*, water, the seventh case plural of which is *upso*, and *rasa*, taste.

UPSAW, in *Geography*, a town of Hindoostan, in Bahar; 6 miles S. of Patna.

UPSILOIDES, in *Anatomy*, a name for the os hyoides. See DEGLUTITION.

UPSTART, CAPE, in *Geography*, a cape on the N.E. coast of New Holland. S. lat. 19° 39′. W. long. 212° 32′.

UPTON, a town of Massachusetts, in Worcester county, containing 935 inhabitants; 38 miles S.W. of Boston.

UPTON *upon Severn*, a market-town in the lower division of the hundred of Pershore, and county of Worcester, England, is situated on the banks of the river Severn, at the distance of 10 miles S. from the city of Worcester, and 109 miles N.W. by W. from London. Though a small town, it has long been in a state of progressive improvement, which may be in some measure attributed to its having a handsome stone bridge of six arches, built in 1605, and a harbour for the reception of the barges employed in the navigation of the Severn, by which a considerable traffic is carried on. Upton suffered much in the civil war of Charles I.; when the bridge was partly broken down for military purposes, and a battery erected in the church-yard to prevent the parliamentary forces from crossing the river. At that time also the church sustained great injury, and though afterwards repaired, it was found necessary, in the year 1756, to take it down; when, it is to be regretted, little attention was paid to the preservation of the painted glass and ancient monuments in the old structure. It was replaced by a very neat modern edifice, the chief ornament of the town. This was opened in 1758; but the tower was not completed till 1774. A charity-school for sixteen girls is established here. No manufactures worthy of notice are carried on: but four fairs are held annually, for the sale of horses, cattle, sheep, and leather: a weekly market is kept on Tuesday. According to the population return in the year 1811, the parish of Upton then contained 394 houses, occupied by 2023 persons. In the year 1787, a circular cavity, about six feet in diameter, was discovered in a corn-field in this vicinity: on examination, this aperture led to a cavern at the depth of about ten feet from the surface, extending in every direction twenty feet in diameter; at about thirty-five or forty feet is a pit or shaft full of water, and nearly 140 feet deep. Various conjectures have been formed respecting this phenomenon; but whether it proceeds from a natural or artificial cause has not been determined.

About four miles from Upton, and near the village of Earl's

Earl's Croome, is Croome Court, the feat and park of the earl of Coventry. The manfion is modern, and the ftyle of its architecture is very plain; but the elegance of the interior makes up for any thing that may appear a deficiency without. The drawing-room is hung with tapeftry of the Gobeline manufacture, of crimfon ground with coloured figures.—Beauties of England and Wales, vol. xv. Worcefterfhire.

UPULUS, in *Botany*, the old Latin name for the *lupulus*, or hop. This word *lupulus* is not old Latin, but a more modern name, formed on the word *upulus*.

UPUPA, in *Ornithology*, a genus of birds belonging to the order of Picæ, the characters of which are, that the bill is bent, long, flender, convex, fubcompreffed, and fomewhat obtufe: the noftrils are fmall at the bafe of the bill; the tongue obtufe, entire, triquetrous, and very fhort; and the feet formed for walking. In the Linnæan fyftem by Gmelin there are eight fpecies, which are as follow:

Epops. Crefted and variegated, or the ferruginous hoopoe, with the wings barred black and white, the tail black, with a lunated white bar, and the creft tipped with black and white. This is the upupa of Bell. Gefn. Aldrov. Ray, &c.; the bubbola of Olin.; the ter-choas or meffenger-bird of Pocock; the hoopoe of Willughby, Pennant, Edwards, &c.; the common hoopoe of Latham; and the la huppe of Buffon. It is an elegant bird, generally inhabiting the warmer and temperate parts of the old continent, and migrating occafionally, at different feafons, in different directions. In our ifland it is much more rarely feen than in other northern climates. It is about the fize of a common thrufh. The colour of the head, neck, and body, is pale ferruginous or cinnamon-brown; the wings and tail are black, the former croffed by five white bars, the latter by a white crefcent; the rump and lower part of the abdomen are white, and the fides generally marked by a few longitudinal dufky ftreaks; on the head is an elegant creft, which it can either erect or expand, or deprefs and clofe at pleafure, compofed of feathers which are cinnamon-coloured, with black tips, a white bar feparating the tip from the reft of the feathers; the legs are fhort and blackifh. The hoopoe migrates during the fpring from Africa into various parts of Europe, and returns in winter. In various parts of Egypt, however, it is nearly domefticated, building even among the houfes. The flefh of thefe domeftic hoopoes is rank and unfit for eating, but that of the migrating birds is confidered in many parts of Europe as an agreeable food, particularly in Italy, the fouth of France, and in the Grecian iflands. Its neft is to be fometimes found in a wall or tree, and is generally faid to have a peculiarly fetid fmell, fuppofed to be chiefly owing to the remains of various kinds of infects. The number of eggs is from five to feven. In Egypt the migrating hoopoe never affociates with thofe of the towns, but frequents remote and folitary places. Such is generally the difpofition of thofe which appear in Europe, but in Africa they affociate in great numbers. Their ordinary food confifts of various kinds of infects and worms, in order to obtain which they follow in Egypt the retreat of the Nile. Thefe birds are generally feen on the furface of the ground, being very rarely obferved to perch on trees. Dr. Shaw mentions as a variety the blue-crefted hoopoe, obferved at Florence and on the Alps, near the town of Rota, and differing from the common hoopoe in having the creft-feathers tipped with fky-blue inftead of black. The *upupa minor*, fmaller hoopoe, ferruginous, with the wings varied with white, and the creft tipped with black, the la huppe d'Afrique of Buffon, may probably be another variety of the common hoopoe, which inhabits the fouthern parts of Africa, and is found in the kingdom of Congo, and at the Cape of Good Hope, frequenting low grounds in the neighbourhood of thickets, and not migratory.

Capensis. Crefted brown, beneath white, with a white fpot on the wings. This is the Madagafcar hoopoe, white, with cinnamon-brown wings and tail, and loofe-webbed creft; la huppe noir et blanche du Cap de Bonne Efperance of Buffon. The tail-feathers of this fpecies are twelve in number; the colour of the creft, throat, and all the under parts of the bird, is white, without any variegation; that of the upper parts, from the back of the head to the end of the tail, dufky or greyifh-brown, deepeft on the wings and tail; on the edge of the wing is a white fpot, the tips of two or three of the larger coverts being of that colour: the legs and feet are yellowifh. It is a native of the ifland of Madagafcar, as well as of fome of the African ifles, and is faid to feed on feeds and berries. From the ftructure of the tongue, which is rather broad, and divided at the extremity into feveral fibres, Dr. Shaw infers, that it is nearly related to the genus merops, or bee-eater.

Promerops. The hoopoe with fix tail-feathers, the intermediate being the longeft. This is the promerops cafer, or brown promerops, whitifh beneath, with rufefcent breaft, and very long tail. Upupa promerops, or Cape promerops of Latham, and promerops of Buffon. The fize of this bird is that of a lark; its colour is rufous brown, fomewhat deeper on the wings and tail; throat white, with a narrow, longitudinal, dufky ftreak on each fide; under part of the abdomen whitifh, dafhed with dufky ftreaks, vent yellow, tail very ftrongly cuneated, bill black, and alfo the legs. In fome, probably the males, the breaft as well as the abdomen is fpotted, and the wings are croffed by a narrow grey or whitifh ftripe. A native of Africa, common about the Cape of Good Hope.

Mexicana. The grey hoopoe, with a mixture of fea-green and purple. Underneath yellow, greater quill-feathers blueifh, and the four intermediate tail-feathers longer than the reft. This is the grey promerops with green and purple glofs, blueifh wings, yellowifh belly, and very long tail; the Mexican promerops of Linnæus, the promerops Mexicanus of Briffon, and promerops á ailes blancs of Buffon. The body of this bird is of the fize of a thrufh. The bill is near two inches long, and blackifh; the whole of the upper parts, except the quills, which are light blue, are grey, with green and purplifh gloffes. The under parts of the body are light yellow, and a fpot of the fame colour is fituated above each eye. This fpecies is faid to be a native of Mexico, frequenting mountainous regions, and feeding on various kinds of infects.

Paradisea. The crefted chefnut-coloured hoopoe, with the two middle tail-feathers much longer than the reft. This is the chefnut promerops, grey beneath, with black-crefted head, and very long tail. The avis paradifiaca criftata orientalis rariffima of Seba, the promerops of Buffon, and crefted promerops of Latham. It is about the fize of a ftarling; the bill is curved, and of a lead colour, as are alfo the legs; the head and neck are a fine deep black; the crown of the head being ornamented by a very confpicuous lengthened femi-pendant creft; the whole remainder of the bird on the upper parts is bright brown, on the under pale afh-colour. A native, according to Seba, of the Eaft Indies, where, as he fays, it is very rare.

Fusca. The brown hoopoe, underneath grey, ftriped with white and black, the crown of the colour of polifhed fteel, the throat and neck black, and two intermediate tail-feathers very long. This is the brown promerops, beneath white, with black undulations, and very long tail. The promerops brun,

brun, á ventre et eyé of Buffon, and New Guinea brown promerops of Latham. According to Sonnerat, who first described and figured it, the neck, back, wings, and tail of this bird are brown; the breast and remaining under parts white, undulated by numerous transverse black stripes, each feather having two white and two black bars; the tail very long, and strongly cuneated, the bill considerably curved, of a blackish colour; and the legs yellowish-brown. A native of New Guinea, inhabiting large woods.

Magna. The black hoopoe; the head, hind part of the neck, breast, and exterior part of the falcated scapular feathers golden green, and very long tail. This is the superb promerops, with violet and green gloss, falcated golden-shining scapular feathers, and very long tail; the grand promerops á paremens frisés of Buffon, and grand promerops of Latham. Its shape is slender, the tail almost three times the length of the remainder of the bird, which is not larger than a common pigeon; the bill narrow, black, and pretty much curved; the general colour of the whole bird is black, accompanied, according to the different directions of the light, by varying reflections of blue, green, and violet; the other parts as above described. The scapular feathers, or those situated along the sides of the body, rise up into two rows of reversed falciform plumes, gradually enlarging from the shoulders to the rump, beyond which they become much longer but less curved, and are stretched to some distance on each side of the base of the tail; the colour of their inner or shallower scales is purplish-black, but along the edges and tip of the wider web it is of a brilliant golden-green: on each side of the lower part of the body, beneath the wings, is also situated a thick and moderately long group of loose-webbed, pendent, brownish feathers; the tail consists of twelve feathers; and the legs are strong and black. This bird was first described by Sonnerat, and is a native of Guinea; but its history and habits are unknown.

Aurantia. The yellow hoopoe, with golden head and neck, and tail even at the end. This is the orange-coloured promerops, with tail of moderate length, and even at the tip; the avis paradisiaca Americana elegantissima of Seba, the promerops orange of Buffon, and the orange promerops of Latham. This bird is about the size of a starling; its bill is somewhat curved, sharp-pointed, and yellow, as are the legs; the head and neck are of a deep yellow or gold colour, with a few red feathers round the base of the bill; the remainder of the bird is orange-yellow; the larger quill-feathers of a redder cast than the rest. A native of Guiana, frequenting the small islands in the mouth of the river Berbice. The supposed female of this species is described by Fernandez, in his History of Mexico, under the name of "Cochitolotl;" it is introduced by Gmelin as a variety of the former; Buffon reckons it a female, and Brisson denominates it promerops Mexicanus luteus. The head, throat, neck, and wings are said to be irregularly varied with grey and black; the rest of the bird yellow; the bill black and the legs grey.

Of the "black hoopoe," nothing but its existence and native country seems to be known: it is mentioned by Sonnini, on the authority of Monf. Viollet, who says that it is found in Africa, towards the kingdom of Congo. For other species, see Promerops, and Shaw's Zoology, vol. viii.

UR, in *Ancient Geography*, a city of Chaldea, where Terah, the father of Abraham, resided; and whence Abraham himself removed to the land of Canaan, which was granted to him and his posterity. (Gen. xi. 28.) The precise situation of this city is not known; some think that it was Camerina, in Babylonia. Ptolemy and Strabo suppose that it was Orcha or Orchea, in Chaldea; and others are of opinion that it was Ura, or Sura, in Syria, on the Euphrates. Bochart and Grotius maintain, that it was Ura in Mesopotamia, two days' journey from Nisibis. The difficulty that occurs in ascertaining its situation, is partly owing to the confusion that attends the settlement of the precise boundaries of Chaldea and Mesopotamia; the former being situated towards the mouths of the Tigris and Euphrates, and the latter between these rivers somewhat farther north. The word *Ur*, in Hebrew, signifies fire; and hence some have pretended, that when Moses said God brought Abraham out of Ur of the Chaldees, he alluded to a fire into which the Chaldeans cast him. But this seems to be fabulous, as St. Jerome, who once adopted their opinion, afterwards acknowledged: and therefore others have thought, that the name Ur was given to this city, because fire was the object of worship; and Abraham, by his removal to Canaan, was released from all obligation to practise that kind of worship.

URA, in *Geography*, a town of Natolia; 10 miles S. of Milets.

URABA, a town and district of South America, in the province of Carthagena.

URAC, the most northerly of the Ladrone islands, in the East Indian sea, about 9 miles in circumference. N. lat. 20° 45′.

URACH, a town of Wurtemberg, with considerable manufactures of damask, and other linens, on the Rems; 21 miles S.S.E. of Stuttgard. N. lat. 48° 27′. E. long. 9° 27′.

URACHUS, in *Anatomy*, a fibrous cord passing from the fundus of the bladder to the umbilicus: it is hollow in the fœtus of animals, and communicates with the allantois. See Embryo and Kidney.

URACONDA, in *Geography*, a town of Hindoostan, in Mysore; 20 miles W.S.W. of Gooty.

URAGO, a town of Italy, in the department of the Mela, on the Oglio; 15 miles W. of Brescia.

URAGUAY, a river of South America, which rises in Paraguay, about S. lat. 26° 30′; and, after a course of about 609 miles, joins the Para, in S. lat. 34°, and the united streams take the name of La Plata. The country on this side the river is also called Paraguay.

URAIN, St., a town of France, in the department of the Nyevre; 7 miles N.E. of Cosne.

URAL, formerly the *Yaik*, a river of Russia, that has its source in the western sides of the Ural mountains, from which it issues near the fort of Orsk, and for a long interval pursues a western course, then turns directly south, and at about 47° N. lat., and 70° long., falls into the Caspian. The current is rapid, and its water pure; and it was known to the ancients under the name of Rhymnus. Its course is estimated at 3000 versts. From time immemorial it has constituted the boundary between the Kirghistzi and the Baskhirtzi; and upon it are still 30 forts and several fore-posts against the former. The most considerable rivers which the Ural takes up are, to the left, the Or and the Ilek; and to the right, the Kisil and the Sakmara. In the upper regions, its banks are ridged with steep and lofty rocks; but lower down it flows through a tolerably dry and very saline steppe. It abounds with fish. The fishery on the Ural forms the principal occupation and support of the Uralian Cossacks; nor is this trade any where so well regulated, by the laws of ancient usage, as here. Ever since the government granted the fishery to the Cossacks, in return for the payment of the moderate stipulation formerly annexed to the utsching or fishing stakes at Gurief, they have completely broken up the

the ſaid fiſh-weir, and inſtead of it, incloſed the whole river about the town of Uralſk by a permanent utſchiug; ſo that, though the fiſh come freely out of the Caſpian into the Ural, they cannot proceed higher than Uralſk. The Ural has all the kinds of fiſh that are found in the Volga, excepting the bream, the red ſalmon, and a ſmall ſpecies of ſturgeon. The firſt and moſt important capture in the year is in January, with hooks; the ſecond laſts from May till towards the middle of June; and the third, which is the leaſt conſiderable, is performed with nets, in October. The firſt great fiſhery in January is chiefly for ſturgeons and belugas. On the day when the fiſhery begins, all the Coſſacks who have tickets of licence aſſemble before ſun-riſe, with their ſledges and implements, at a ſtated place before the town, ranging themſelves in rows and ſections, according to the order in which they arrive. They are then muſtered by a proper officer and formed; notice is given by firing of cannon when the operation is to commence, or the breaking up of the ice for fiſhing. The order and ceremonial are the ſame for the ſecond great capture of the ſevrugas in ſpring as in the winter fiſhery, and a certain boundary is fixed for marking the extent of the fiſhery. The Coſſacks, while fiſhing, ſit ſingly in little canoes, commonly made of the trunks of the black or white poplar, paid over with aſphaltus inſtead of pitch. The nets are between 20 and 30 ells in length. The autumnal fiſhery is alſo conducted in the ſame manner with the others. This is performed with large caſting nets, and they are allowed to take, beſides the ſmaller ſpecies of fiſh, all ſorts of ſturgeons. The largeſt belugas caught in the Ural weigh often 25 pood, and yield about 5 pood of kaviar or cavear, which on account of its ſtringineſs is reckoned the worſt. The ſturgeons are about a fathom in length, and the largeſt of them weigh 5 pood, and contain a pood of kaviar, which is moſt eſteemed for its quality. The fiſh here, as at the Volga, are moſtly ſalted; kaviar is prepared from the roes, and fiſh-glue made of the mucilaginous ſubſtances; but the winter-fiſh are tranſported frozen. Tooke's Ruſſia, vol. iii.

URAL *Mountains*, a famous chain of mountains in Ruſſia, which forms the natural boundary between Europe and northern Aſia, called Ural, or the belt, as if it girted the whole world. The ancients gave this chain the appellation of the Hyperborean and the Ryphæan mountains, and ſometimes "Montes Rhymnici." Under the laſt of theſe denominations, the Baſhkirian Ural was more particularly deſignated. The Northern Ural they termed "Montes Hyperboræos" or "Riphæos;" and the ſouthern "Rhymnicios." The former were afterwards called the Yugorian mountains. Ural is a Tartarian word, ſignifying a belt, or girdle; by which the Ruſſians likewiſe denote this range; for they call it Kammenoi, and Semnoi Poyas; that is, the rock, or earth-girdle. Theſe mountains extend from S. to N., almoſt in a direct line, much above 1500 Engliſh miles. They commence with the mountains between the Caſpian and the lake Aral, and attain their greateſt height and bulk about the ſources of the rivers Ural, Tobol, and Emba; and from thence they ſtretch on towards the origin of the Tſhuſſovaia and the Iſets, and further on to the ſources of the Petſhora and the Soſva; and laſtly, form two great promontories about the Karian haven of the Frozen ocean: after being divided by the ſtraits of Vaygat, or Waygat, they terminate in the mountains of Nova Zemla. From this chain ſome conſiderable collateral branches take a weſtern as well as an eaſtern courſe. The moſt material from the former ſide are thoſe called Obſchtſchei-Sirt, the mounts of ſeparation, running out between the river Ural and the Sakmara, uniting on one ſide with an arm iſſuing from the Kirghiſtzi-ſteppe, on the left ſhore of the Ural; and on the other ſide projecting into the old Kalmuck-ſteppe, between the Volga and the Ural, and northerly joining the ſand-ſtone mountains, which accompany the main courſe of the Ural on the weſtern ſide. Near the forts of Orſk and Guberlinſk, a part of the mountains runs out ſouth-eaſtward into the Kirghiſtzi deſerts, and reaches to the mountain Ulutau, which ſtands about the centre of that region, and is attached to the great Altay. This arm is called the Guberlinſkoi mountains. Another courſe, ſmaller than the preceding, runs ſouth-eaſtward, between the rivers Ural and Ui, under the name of Okto-Karagai, through the open ſteppe of the middle horde of the Kirghis-kaiſaks, and then purſues its way, under the appellation of Alginſkoi-Sirt, towards the Irtiſh and the Altay mountains. The whole Ural chain may be divided into three parts, *viz.* the Kirghiſtzi Ural, extending from the Caſpian and the Aral, and eaſtward out of the great ſteppe of the Kirghis-kaiſaks, as far as the origin of the Tobol and the Yemba; the Ural rich in ores, or Ural ore mountains, comprehending the whole mountainous track, with its weſtern and eaſtern appendages, from the riſe of the ſaid rivers and the Guberlinſkoi mountains, quite up to the ſources of the Solva and Kolva; and the deſert Ural, extending from theſe rivers to the Frozen ocean. The Ural abounding in ores may be ſubdivided into the Orenburg, the Ekatarinenburg, and the Verchoturian Ural.

This main courſe of the Ural mountains declines much more on its weſtern ſide than on the eaſtern, and on the former has a conſiderable track of collateral ridge, very rich in copper, and moſtly compoſed of ſchiſtoſe ſand-ſtone. The higheſt mountain of the Ural chain is in the Baſhkirey (or in the Orenburg Ural), and in the Verchoturian Ural.

The Ural chain is of itſelf a main mountain, whoſe higheſt ridges, for the moſt part, conſiſt of granite, and of all the properly primitive rocky materials. In minerals the Ural mountains are very rich; abounding with beautiful ſorts of granite, porphyry, excellent jaſper, fine quartz, petrofilex, pebbles, whetſtones, flints, agates, chalcedonies, large mountain cryſtals, ſmoky topazes, or brown rock cryſtals, fine amethyſts, chryſolites, porcelain and pipe-clay, bolus, ſhelly felſpar, ſerpentine, potſtone, window-mica, aſbeſtus, and amianthus; beautiful marbles, table-ſchiſtus, gypſum, flowers of ſpar, turf, coals, mineral oils, naphtha, native ſulphur, marcaſites, foſſile ſalts, ſources of common ſalt, bitter lakes, alum, vitriolic earths, ſalt-petre, natron, iron, copper, gold, and ſpecimens of ſilver and lead. For working of the gold, copper, and iron, very expenſive and productive fabrics are here erected. The Ural mountains are alſo amply furniſhed with woods; ſuch as pines, birch, fir, cedar, larch, aſpin, alder, and on the S.W. ſide a few oaks, elms, lindens, &c. In the vallies adjoining to this range of mountains are rich and verdant glens, and dales and meads in alternate ſucceſſion; ſo that the breed of cattle is not inconſiderable. Among the wild beaſts and birds, which are very plentiful, may be reckoned ſables, beavers, rein-deer, elks, &c. The various elevations are copiouſly ſupplied with beautiful pellucid lakes, ponds, and numberleſs ſtreams, all teeming with fiſh. The principal rivers that take their riſe in this chain of mountains are the Soſva, the Tura, the Iſſet, the Ui, the Tobol, the Yemba, the Ural, the Belaia, the Tſhuſſovaia, the Kamma, the Petſhora, &c. Tooke's Ruſſia, vol. i.

URALLA, a conſiderable Turkiſh village, ſituated on the ſide of a mountain, at about the diſtance of a mile from the ſhore, commanding a proſpect of the whole of the ſpacious

cious gulf of Smyrna, as far as Mitylene. The greater part of the fine Smyrna raisins come from Uralla, where several cargoes are prepared annually. At the season of the racolta, or fruit-harvest, the Smyrna merchants send their clerks to attend its ingathering, and at that time there is much business transacted in this village.

URALSK, a town of Russia, in the government of Caucasus, on the Ural; 328 miles N.N.E. of Astrachan. N. lat. 51° 10′. E. long. 51° 54′.

URAMARCA, a town of Peru, in the diocese of Guamanga; 60 miles E. of Guamanga.

URAMEU, a town of Brasil; 48 miles N.E. of Para.

URAN. See OURAN.

VRANA, a town of Istria; 9 miles E.S.E. of Pedena.—Also, a town of European Turkey, in Servia; 25 miles E.S.E. of Pristina.—Also, a river of Bulgaria, which runs into the Black sea at Varna.

VRANA, or *Urana*, a town of Dalmatia, situated on a lake to which it gives name, anciently an important fortress belonging to the Templars, and the residence of the grand prior. This castle, which at the time of its foundation was named *Brana*, or *Vrana*, by way of dignity, is now a frightful heap of ruins, reduced to that state by the Venetians. Some writers have thought that Bandona was anciently seated there; but no vestige of Roman antiquity is to be seen about these walls, and ruined, uninhabited towers. The khan, or caravanserai, is worthy of observation, although it is now in a ruinous state, being abandoned to the barbarity of the Morlacchi, who inhabit the neighbouring lands, and carry off whatever materials suit them, to be employed in their wretched cottages. The name of Vrana is now transferred to a wretched village, that stands about a mile from the ruins of the fortress, in the very place where an eminent Turk of the last age, called Hali Bey, had his gardens; and the squalid habitation of the curate of the parish lately went by the name of Hali Bey's gardens. The lake of Vrana is more famous and better known at Venice than any other in Dalmatia, not only on account of its considerable extent of 12 miles, but from the project formed by a private person, and partly put in execution, to cut a passage by which the water might be discharged into the sea; 15 miles E.S.E. of Zara.

URANA, a river of South America, which runs into the Caribbean sea; 9 miles W. of Cumana bay.

URANDA, a town of Japan, in the island of Xicoco; 12 miles S.S.E. of Tosa.

URANDUK, a town of Bosnia; 2 miles E. of Seraja.

URANIA, in *Ancient Geography*, a town of the isle of Cyprus, taken by Demetrius, according to Diodorus Siculus.

URANIA, in *Botany*, a name for which the classical Schreber has well exchanged the barbarous RAVENALA of Adanson and his followers; see that article. This latter seems, by Jacquin's account, to be altered from *Ravenne ala*, signifying, as he had some reason to believe, the *leaf of God*, among the inhabitants of Madagascar. In the application of *Urania*, Schreber had probably in view, not so much the "heavenly muse," according to the explanation of De Theis, as the Greek adjective ουρανιος, *great*, *admirable*, or *sublime*, which so well answers to the majestic stature and large proportions of this very fine plant.—Schreb. Gen. 212. Willd. Sp. Pl. v. 2. 7. Mart. Mill. Dict. v. 4. (Ravenala; Juss. 62. Lamarck Illustr. t. 222.)—Class and order, *Hexandria Monogynia*. Nat. Ord. *Musæ*, Juss.

Gen. Ch. *Cal.* Common Sheaths alternate, each of one leaf, ovato-lanceolate, concave, many-flowered; partial ones inferior, each of two linear-lanceolate, long, channelled, pointed, erect, coloured, permanent valves; perianth none. *Cor.* Petals three, superior, oblong, channelled, erect, acute, equal. Nectary of two equal leaves, one of them cloven, (according to Adanson). *Stam.* Filaments six, thread-shaped; anthers vertical, erect, linear, longer than the filaments, and about equal to the nectary, inclining at the summit. *Pist.* Germen inferior, oblong; style rather longer than the stamens; stigma in six converging segments. *Peric.* Capsule oblong, abrupt, triangular, of three cells, and three woody valves, connected at the base; the partitions from the centre of each valve. *Seeds* numerous, in two rows, roundish-oblong, each with an umbilicated, fleshy, laciniated, coloured, radiating tunic, spreading from the scar.

Eff. Ch. Sheaths general and partial. Perianth none. Petals three. Nectary of two equal leaves, one of them cloven. Capsule inferior, of three cells. Seeds numerous, in two rows, each with a coloured tunic.

1. U. *speciosa*. Superb Urania. Willd. n. 1. Ait. Epit. 376. (Ravénala madagascariensis; Sonnerat Voy. aux Ind. Or. v. 2. 223. t. 124—126. Jacq. Hort. Schoenbr. v. 1. 47. t. 93.)—Native of marshy ground in the island of Madagascar. Cultivated in the Mauritius, from whence it was carried to the imperial garden at Schoenbrun, in 1782, and to the stoves of Kew, in 1810.

This is one of the most stately of plants, with respect to its habit, and the proportion of every part, though perhaps inferior in stature to many trees. The *stem* is erect, and, according to Sonnerat, very lofty, though he does not mention its precise height, round, marked with numerous scars where the foliage has formerly been, otherwise naked and smooth, quite simple, crowned at the summit with an ample, radiating, vertical tuft, of very numerous, stalked, alternate *leaves*, spreading in two ranks, like a vast fan, many feet wide. Each *leaf* is oblong, entire, obtuse at each end, with one rib, and numerous transverse, parallel veins, smooth, resembling the leaves of the *Musa*, or Plantain-tree, but larger and thicker. *Footstalks* sheathing from the base about half way up. Sonnerat makes their length about two feet, but Jacquin says ten, adding that each leaf is six feet long, and two wide. If this be correct, the whole diameter of the fan-like head may be thirty-two feet! We might have felt a suspicion that Jacquin's plant, which, in the course of fifteen years' cultivation in the stove at Schoenbrun, never flowered, nor formed any stem, might be the *Strelitzia augusta* of Thunberg, Willdenow, and Aiton; had not the author expressly mentioned its having been raised from seeds taken out of the *capsules* delineated in his plate, which indubitably belong to our *Urania*, whose *flower-stalks* are axillary, scattered, shorter than the footstalks, zigzag, very stout, and finally woody, each bearing six or eight alternate, two-ranked, rigid, pointed sheaths, filled with numerous, erect, whitish *flowers*, whose *petals* are seven or eight inches long. *Capsules* brown, rugged, three or four inches in length. *Seeds* the size of a horse-bean, black, their tunics of a fine blue, and curiously jagged.—The inhabitants of Madagascar use the leaves as a covering to their houses. Flacourt, it seems, has described this plant, in his History of Madagascar, by the name of *Voafoutsi*, (Botany is happy to have escaped this name,) and he there relates that the natives make an oil from the tunic of the seeds, and grind the substance of the latter into meal, which they eat with milk.

After all that we can collect, the *Urania* itself, if distinct from *Strelitzia augusta*, is so very nearly allied to *Strelitzia* in genus,

genus, that we should not wonder if they prove the same. We have been shewn at sir J. Banks's, a native *capsule* and *seeds* of a *Strelitzia* from the Cape, which answer exactly to the characters of *Urania*, though no *tunic* is described in STRELITZIA; see that article.

URANIA, or *Cœlestis*, in *Mythology*, one of the nine Muses that presided over astronomy: she is represented as clothed with an azure-coloured robe, crowned with stars, holding a globe in her hand, or sometimes with the globe at her feet, and surrounded with several mathematical instruments. On medals the globe stands upon a tripod.

URANIA, a goddess of the Arabians, and of the Moors of Africa, called also *Alilat* and *Cœlestis*. The Urania of the Arabs is supposed to have been the Moon, as Bacchus was the Sun; and these two luminaries were among them objects of worship. The Cœlestis of the Moors, mentioned by Tertullian, was the Venus Urania, so well known in Syria, that is, the planet of that name; for it is certain that almost all nations worshipped the stars, and had gods natural and gods animated.

URANIBURGH, q. d. *the City of the Heavens*, a term often heard among astronomers, being the name of a celebrated observatory, in a castle in the little island Weenen, or Huen, in the Sound; built by that noble Dane, Tycho Brahe; and furnished with instruments for observing the course and motions of the heavenly bodies.

This famed observatory, finished about the year 1580, did not subsist above seventeen years; when Tycho, who little thought to have erected an edifice of so short a duration, and who had even published the figure and position of the heavens, which he had chosen for the moment to lay the first stone in, was obliged to abandon his country.

Soon after this, those to whom the property of the island was given, made it their business to demolish Uraniburgh: part of the ruins was dispersed into divers places; the rest served to build Tycho a handsome seat upon his ancient estate, which to this day bears the name of Uraniburgh. For as to the ancient Uraniburgh, there is now no footstep of it remaining. It was here Tycho composed his catalogue of the stars.

M. Picart, making a voyage to Uraniburgh, found Tycho's meridian line, drawn thereon, to deviate from the meridian of the world: which confirms the conjecture of some, that the position of the meridian line may vary. See TYCHO BRAHE.

URANIUM, in *Mineralogy* and *Metallurgy*, a metal so called from the planet Uranus or Herschel, by the celebrated chemist Klaproth, who discovered it in 1789, in an ore which had been formerly supposed to contain zinc or iron. Uranium is of an iron-grey colour; it possesses considerable metallic lustre; it is brittle and hard, but yields to the file. It has hitherto only been obtained in grains, or in small quantities as a porous cohering mass. The specific gravity of uranium, according to Klaproth, is 8.01; but according to Bucholz, 9. Uranium melts with great difficulty; but when heated to redness in an open vessel, it undergoes a species of combustion, glowing like a coal, and is converted into a black powder, gaining in weight about five parts in the hundred. This powder is the black oxyd. The yellow oxyd is obtained by precipitating uranium from its solution in nitric acid by an alkali. The yellow oxyd of uranium is insoluble in pure alkalies, but is soluble by the alkaline carbonates; the former property distinguishes it from the oxyd of tungsten. The yellow oxyd consists of eight parts metal, and twenty of oxygen. The combinations of uranium with the other metals are unknown. With sulphur the yellow oxyd of uranium may be combined, by mixing two parts of sulphur and one of oxyd, and exposing the mixture to heat in a crucible. Most of the sulphur is driven off; the residuum is a blackish-brown mass, being a sulphuret of uranium. If the heat be increased, the whole of the sulphur is sublimed, and the uranium remains in a metallic state, in the form of a black coarse powder. Metallic uranium is only perfectly soluble in nitric acid. Bucholz supposes that there are several oxyds of this metal, distinguished by their different colours, as under:

Protoxyd,	-	Greyish-black.
Second oxyd,	-	Dark grey, inclining to violet.
Third oxyd,	-	Greenish-brown.
Fourth oxyd,	-	Greyish-green.
Fifth oxyd,	-	Orange.
Peroxyd,	-	Lemon-yellow.

To obtain uranium from its ores, in which it exists in the state of oxyd, the ore must be dissolved in dilute nitric acid. The solution may contain iron, copper, and lime. By evaporating it to dryness, and exposing the dry mass to a moderately strong heat, the iron is rendered insoluble, but the other ingredients will be taken up by distilled water. Ammonia poured into this solution, and digested in it for some time, retains the copper, but throws down the uranium.

The precipitate is to be washed with ammonia till the liquid comes off colourless; it is then to be dissolved in nitric acid, and to be concentrated by evaporation, and set by to crystallize. The green-coloured crystals that form, may be picked out and dried on blotting-paper, then dissolved in water, and the liquid partly evaporated and left to crystallize. By this means the whole of the lime will remain behind. The crystals will consist of pure oxyd of uranium united to nitric acid; they are to be exposed to a red heat; a yellow powder remains, which is the oxyd of uranium. This powder is to be mixed with a small quantity of charcoal powder, and exposed to a violent heat, by which it is reduced to a metallic state. The experiment succeeds best when the oxyd is mixed with only the one-twentieth part of charcoal, and inclosed in a charcoal crucible to exclude the air. Klaproth employed a heat equal to 170° Wedgwood, to obtain this metal. No flux has hitherto been found of any service in facilitating the reduction of uranium.

Uranium has not hitherto been applied to any useful purpose in the arts, either in its metallic state, or in combination with acids as a metalline salt.

With nitric acid, oxyd of uranium unites in two proportions. The nitrate is an extremely soluble salt, of a lemon-yellow colour. The crystals have generally the form of hexagonal tables, more or less perfect; but by careful management, they may be obtained in large four-sided rectangular flat prisms. At the temperature of 100°, they fall into a white powder. In a damp atmosphere, they soon deliquesce.

They consist, according to Bucholz, of

Oxyd of uranium	61
Acid	25
Water	14
	100

When nitrate of uranium is heated till its colour becomes orange-red, it does not dissolve completely in water, but leaves a yellow powder, which has been shewn by Bucholz to be a subnitrate.

The oxyd of uranium combines with the muriatic and sulphuric

fulphuric acids, alfo with the acetic, the tartaric, the phofphoric, and fluoric acids, and with thofe of tungften and molybdena. Richter formed likewife the borate, oxalate, citrate, malate, benzoate, fuccinate, and febate of uranium; but the properties of the latter falts have not been defcribed. See SALTS and ACIDS.

Ores of Uranium.—Pitch-blende or *Pitch-ore*, *Pecherz*, Werner; *Uran Oxidulé*, Hauy. This mineral was firft obferved in a mine at Johan-Georganftadt, in Saxony. From its black colour, and other properties, it was for fome time fuppofed to be a blende, or ore of zinc. M. Werner placed it among iron-ores, and afterwards fuppofed that it contained wolfram. Klaproth analyfed this ore in 1789, and found that it confifted principally of fulphur, combined with a metal to which he firft gave the name of uranium. This ore occurs in veins in primitive rocks, in feveral places in Cornwall, in Saxony, and in Norway; it is commonly accompanied with galena, copper pyrites, and iron ochre, and with quartz, calcareous fpar, and fulphate of barytes. It is alfo fometimes affociated with ores of filver and cobalt.

The colour of pitch-blende is velvet-black, or greyifh-black, fometimes inclining to green and brown. It occurs maffive, and diffeminated alfo reniform, botryoidal, and pulverulent. The luftre internally is refinous, more or lefs fhining. The ftructure is fometimes imperceptible; in other fpecimens it is lamellar. Pitch-blende is brittle; the fracture is imperfectly conchoidal; the fragments are angular and fharp-edged. It yields readily to the knife, but the colour of the ftreak is not changed. The fpecific gravity of this ore is 7.5.

Pitch-blende is infufible without addition by the blow-pipe: with borax it yields a grey flag; with phofphate of foda, a clear green globule. It diffolves imperfectly in the fulphuric and muriatic acids, but is almoft entirely diffolved in the nitric and nitro-muriatic acids. The folution has a pale orange-green colour; and from this folution the metal is precipitated by the phofphate of potafh and the alkalies: with the former, the colour of the precipitate is a brownifh-red; with the latter, yellow.

The conftituent parts of this ore, as given by Klaproth, are,

Oxyd of uranium - -	86.5
Black oxyd of iron - -	2.5
Galena - - - -	6
Silex - - - -	5
	100

Pitch-blende may be diftinguifhed from brown blende by its colour, fpecific gravity, fracture, and ftreaks; from wolfram by its ftreak and fracture.

Uranite, or *Uran mica*, *Urane oxidé*, Hauy. The colour of this ore is lemon-yellow, paffing into orange, and into apple-green and emerald-green; it becomes brownifh by decompofition. It occurs cryftallized in rectangular prifms and tables, and fometimes in imperfect octohedrons. The edges of the cryftals are frequently bevelled and truncated. The ftructure is lamellar, with diftinct joints in one direction, parallel to the bafes of the cryftals; the other joints are indiftinct. The lamellæ are inflexible, and tranfparent or tranflucent, with a fhining pearly luftre. Uranite yields eafily to the knife; the fpecific gravity is 2.19. The cryftals are generally fmall. Sometimes this mineral occurs maffive, in granular diftinct concretions; and fometimes it is found pulverulent, and in fmall tubercles, which have a glimmering or dull luftre, and an orange or green or reddifh-brown colour. Uranite decrepitates violently before the blow-pipe; it lofes about 33 *per cent.* by ignition, and acquires the colour of brafs. With borax it yields a yellowifh-green glafs. This ore diffolves without effervefcence in nitric acid, and communicates to it a lemon-yellow colour.

Its conftituent parts, as given by M'Gregor, are,

Oxyd of uranium, with a trace of oxyd of lead	74.4
Oxyd of copper - - - - - -	8.2
Water - - - - - - - -	15.4
Lofs - - - - - - - -	2
	100

Uranite occurs in veins in the mines of Cornwall, and in Saxony and France: it is generally accompanied with the ores of iron.

The pulverulent uranite is called by the Germans uran-ochre. Indurated uran-ochre alfo occurs with the other ores of uranite, either maffive or diffeminated; the colour is the fame as the pulverulent. It is foft and brittle; the fpecific gravity is 3.15. According to Klaproth, the yellow varieties are pure oxyd of uranium; but the brownifh and reddifh contain a little iron.

URANOPOLIS, in *Ancient Geography*, a town of Afia, in Pamphylia, and in the country called Carbalia. Ptolemy.—Alfo, a town of Macedonia, in the Chalcide; fituated on mount Athos, near the fouthern fide, and the promontories Nymphaum and Auvathon. Pliny. Athenæus fays, that this town was founded by Alexarchus, the brother of Caffander, king of Macedonia.—Alfo, an epithet given by Athenæus to the city of Rome.

URANOSCOPUS, in *Ichthyology*, the name of a fifh, called in Englifh the *ftar-gazer;* and by fome authors, *callionymus*.

The uranofcopus, in the Linnæan fyftem, is a genus of the order of Jugulares: its characters are, that the head is depreffed, rough, and large; the mouth has the upper jaw fhorter than the lower; the branchioftege membrane has five rays, and is covered with fmall eminences like teeth; the opercula are membranous and ciliated; the anus is in the middle of the body. Gmelin mentions two fpecies: *viz. fcaber*, or ftar-gazer, with bearded lips and fmooth back. It is ufually caught about feven or eight inches in length, but fometimes it grows to a foot; its head is very large, of a fort of fquare figure, covered by a ftrong bony cafe, roughened by an infinite number of fmall crefts or protuberances; each fide of this cafe is terminated above by two fpines, the under part has five fpines fmaller than thofe above. Its mouth is large, and opens perpendicularly downward, being placed in the fame direction with the eyes in the upper part of the head; the tongue is thick, fhort, and roughened with a number of fmall teeth; under its chin is a beard or long cirrus extending to fome diftance beyond the lips; its eyes are fmall and prominent, and are fo placed near each other in the upper part of its head, as naturally to look up to the heavens, whence it has its name; and though many of the flat fifh have their eyes placed like thofe of this fifh, yet the pupils in thefe are directed fideways, whereas in this only they are turned ftraight upward; the body is of a fquarifh form as far as the vent, and then it becomes cylindric: it is covered with fmall fcales, and marked near the back by a lateral line, compofed of fmall pores or points bending from the neck to the pectoral fins on each fide, and from thence in a ftraight line to the tail: on the back are two fins, the firft being much fhorter than the latter, and furnifhed with ftronger fpines; the pectoral fins are large, with foft rays; the ventral fins are fmall; the tail is of moderate

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derate size, and rounded at the end; the colour of the body is brown, with a whitish or silvery cast towards the abdomen; the head, pectoral fins, and tail having a strong ferruginous cast, and the first dorsal fin being marked towards its hind part by a large black spot.

The star-gazer is an inhabitant of the Mediterranean and Northern seas, frequenting chiefly the shallow parts near the shores, and concealing itself in the mud, with the top of its head only exposed: in this situation it waves the beards of the lips, and particularly the long cirrus of the mouth, in various directions, thus alluring the smaller fishes and marine insects that are near, who mistaking these organs for worms, are instantly seized by their concealed enemy. As an article of food it is coarse, and of an ill flavour: the gall was anciently considered as peculiarly efficacious in external disorders of the eyes.

The reason of the situation of the eyes of the uranoscopus, is the providence of nature for a fish, which, always keeping at the bottom, has no where to look for prey but in the water above it. But if other fish had been well examined, this peculiar name would never have been given to this. The eyes of the *rana piscatrix* are placed in the same manner, and those of a great number of other fish, whose custom it is to keep at the bottom, are more or less also thus situated. Gesner. Gmelin. Shaw.

Japonicus. With the back roughened by a semi-range of spinous scales. Found in the sea encompassing Japan. This is above yellow, and underneath white.

URANUGRATZ, in *Geography*, a town of Croatia; 18 miles N.N.W. of Novi.

URANUS, in *Mythology*, the great divinity of the Phœnicians. According to Sanchoniathon, he was the son of Elion, called Hypsistus, who lived in the neighbourhood of Byblos, by his wife Beruth. These had a son, first called Epigeus, and afterwards Uranus, and a daughter named Gé. The names of these two children the Greeks have given to heaven and earth. Hypsistus, having died at a hunting-match, was advanced to divine honours, and had sacrifices and libations offered to him. Uranus took possession of his father's throne, and having married his sister Gé, had several children by her. Uranus, as the fabulous history relates, was expelled from the throne by his son Chronus, on account of the offence given to his mother Gé by his infidelity, who succeeded to his power. According to the theogony of the Atlantidæ, who lived in the western parts of Africa, preserved by Diodorus Siculus, Uranus, or Coelus, was their first king, and brought his subjects, who had before his time wandered about without any fixed residence, to live in society, and to cultivate the ground. He also studied astronomy, and regulated the year by the course of the sun, and the months by that of the moon; and by calculating the motions of the heavenly bodies, he delivered predictions, the accomplishment of which astonished the Atlantidæ to such a degree, that they thought him divine, and after his death enrolled him among the gods. Uranus had by his several wives forty-five children, and by Titæa alone eighteen, whence sprang the appellation of Titans. See Titans.

VRASA, in *Geography*, a town of Sweden, in the province of Smaland; 16 miles S. of Wexio.

URATOOR, a town of Hindoostan, in the circar of Cuddapa; 14 miles W. of Cuddapa.

VRAZZA, a town of Bulgaria, on the Esker; 24 miles N.E. of Sophia.

URBAIN, St., a town of France, in the department of the Upper Marne; 3 miles S.E. of Joinville.

URBAN I., *Pope*, in *Biography*, succeeded Calixtus I. A.D. 223, and occupied the pontifical chair till the year 230, when, as it is said, he was beheaded under the emperor Alexander Severus; so that the Roman senate has ranked him in the number of its martyrs. Bower.

Urban II., *Pope*, named *Otho*, or *Eudes*, was born, as it has been generally thought, at Chatillon-sur-Marne, and educated under Bruno, founder of the Carthusian order; and devoting himself to a monastic life in the monastery of Cluny, became abbot of that institution. Being called to Rome, in 1078, by pope Gregory VII., he was made cardinal and bishop of Ostia; and in 1088, after the death of pope Victor III. in 1087, the Romans unanimously elected him as his successor, when he assumed the name of Urban II. He was no less proud and arrogant than his patron Gregory, with less fortitude, but greater temerity. In the second year of his pontificate he assembled a council at Rome, which excommunicated the anti-pope Guibert, together with Henry IV., of Germany, by whom he was supported, and all his adherents. He also held another council at Melfi, in Apulia, which confirmed the decrees of Gregory against lay investitures and the marriage of the clergy. The pope, in order to counteract the power of the emperor, promoted a marriage between Guelph, duke of Bavaria, and the countess Matilda; upon which Henry marched into Italy, and having reduced Mantua, and other places, recalled Guibert to Rome, and put him in possession of the Lateran palace, when the emperor's progress was checked by the revolt of his son Conrad: under the instigation or approbation of Urban, Guibert was expelled, and Urban returned to Rome in 1093. In the year 1095, a council was held at Placentia, to which a solemn embassy was sent by Alexius Comnenus, emperor of Constantinople, the object of which was to state the oppressions of the infidels, and to request assistance on behalf of the Christians of the East. The pope and several great lords interested themselves in their cause, and proposed personally and otherwise to afford them succour. At this council, the doctrine of transubstantiation was asserted; the marriage of the clergy was rigorously prohibited; and Guibert and his partisans were again anathematized. After an interview between Conrad and the pope, he was recognized as king of Italy, on the condition of an oath of allegiance to the apostolic see. In 1095 Urban visited France, and held a council at Claremont, the first business of which was the excommunication of king Philip, for refusing to part with Bertrade, who had been his mistress, and whom he had married, after having repudiated his queen Bertha. Among other canons passed by this council, one forbade a bishop or priest to promise fidelity to a king or any layman. The "Treuga Dei" (see Truce *of God*) was strongly enforced, and all former decrees relating to it were confirmed. But this council rendered itself peculiarly famous, by first introducing the project of crusades. (See Croisade.) During Urban's abode in France, he held other councils; and in one of them absolved Philip, who had dismissed Bertrade; and he returned to Italy in 1096. At Salerno he had an interview, in 1098, with Roger, duke of Sicily, when he is supposed to have granted the bull of the "Monarchy of Sicily," in consequence of which, the sovereign of Sicily is supreme head of the church in his dominions. Although the authenticity of this bull has been disputed, the powers confirmed by it have been occasionally exercised ever since that period. This pope took part with Anselm, archbishop of Canterbury, and the other English clergy, against William Rufus, who had made free with their temporalities, and threatened the king with excommunication. In the year 1099, the second crusade took place, in which Jerusalem was captured; but Urban did not live to receive this agreeable intelligence; for he terminated a busy pontificate

cate of eleven years and above four months, at Rome, in July of this year. Over his tomb in the Vatican was placed this inscription: "Urbanus II. Auctor Expeditionis in Infideles." Miracles have been ascribed to Urban by the monkish orders; but they have not been sanctioned by the Roman church. Several of his letters, and of the decrees of councils convened by him, are extant. Bower. Mosheim.

URBAN III., *Pope*, was elected to the pontificate on the decease of Lucius III., in December 1184. Several disputes were excited between him and the emperor Frederic Barbarossa, which occasioned his menace to excommunicate the emperor; but Barbarossa appealed to an assembly of prelates and princes in Germany in vindication of his rights, and they wrote a letter to the pope on the subject of complaint. Such was his indignation, that he threatened to fulminate his sentence at Verona, but the inhabitants of that city would not permit it. Soon after he is said to have died of grief, upon hearing of the capture of Jerusalem by Saladin, in 1187. Bower.

URBAN IV., *Pope*, named *Pantalion*, was born of mean parentage at Troyes, in Champagne, studied at Paris, and rose through several gradations of preferment to the papal chair, on the death of Alexander IV., in 1261. At two promotions of cardinals, he is said to have created fourteen, who did honour to his choice. Manfred, who usurped the crown of Sicily, was excommunicated for refusing to obey his summons to Rome, and a crusade was also preached against him. Afterwards disturbances occurred in the city, which caused the pope to retire to Orvieto, where he resided with his cardinals during the greatest part of his pontificate. He made an unsuccessful attempt, by the interference of his authoritative counsel, to terminate the war which raged in Germany on account of a competition for the empire: and having failed in his negotiation with Manfred, he offered the kingdom to Charles of Anjou, brother of king Louis IX., by whom it was accepted; but before he was informed of the result, he died at Perugia, in October 1264. This pope instituted the festival of "Corpus Christi," in honour of the holy sacrament, by a bull dated in 1264. The sanctity of his manners, and his liberality to the poor, have been recorded to his honour; and Tiraboschi produces evidence of his having been an encourager of philosophical studies; and the mathematician Campano compliments him with being the patron and associate of men of learning. He is said to have laid his injunctions on the famous Thomas Aquinas, to write commentaries on Aristotle. His own epistles that are extant are of little or no importance. Dupin. Bower.

URBAN V., *Pope*, was at an early age a Benedictine, and studied civil and canon law at Montpellier, of which he became a professor in that university, and at Avignon, Toulouse, and Paris. After some subordinate promotions, he succeeded Innocent VI. in the papal chair, A.D. 1362. At the commencement of his pontificate he was visited by three sovereigns; one of whom, *viz.* Lusignan, king of Cyprus, solicited his assistance against the Turks, who threatened to invade his dominions. In compliance with this request, the pope engaged the other two kings, *viz.* John of France, and Waldemar of Denmark, to engage in a crusade for that purpose; but the design was rendered abortive by the death of the French king. In 1365, the emperor Charles IV. visited the pope at Avignon, which was then the seat of the papal see; but soon afterwards the pontiff was invited to Rome, and to make that city, which was his proper capital, the place of his abode. Accordingly, on the last day of April, 1367, he set out on his journey, and in October made his solemn entry into Rome. In the following year he was visited by Charles, who accompanied him from Viterbo, on his second entrance into Rome, walking by his side, and holding his stirrup from the Colline gate to St. Peter's. He was also honoured by the visit of another emperor, John Palæologus, of Constantinople, who professed every article of faith held by the Roman church, acknowledging its primacy, and swearing perpetual obedience. This victory over the Greek church was highly gratifying to the pope. At this time Urban announced, to the surprize and disappointment of the Italians, his intention of returning to Avignon. Various attempts were made to dissuade him from accomplishing his purpose; and St. Bridget, then famous for her revelations, predicted that if he undertook such a journey he would not be able to compleat it. Notwithstanding every kind of opposition, he retained his purpose, and arrived at Avignon in September, 1370. But the termination of his life was approaching, and having made that kind of preparation for it which his religion enjoined, he resigned himself with composure and acquiescence, expiring December 19, 1370. This pope has been highly commended for his public and private virtues. He extirpated abuses, checked the ambition and restrained the avarice of aspiring ecclesiastics, and deviated from the example of other pontiffs, by raising only one relation, *viz.* his own brother, to the purple, and not permitting even his father, who lived to 100 years, to accept a pension from France. To the poor he was liberal, and in erecting public works munificent. He encouraged learning by founding universities, and he is said to have maintained 1000 students at his own charge. He restored to its ancient splendour the university of Bologna, which service was highly extolled by Petrarch. Several of his letters have been published, and a volume of them exists in the Vatican library. Dupin. Moreri. Gen. Biog.

URBAN VI., *Pope*, was elected, if the expression may be used, by a conclave of cardinals, compelled by the populace of Rome to name and enthrone Bartolomeo Prignani, archbishop of Bari, who assumed the name of Urban VI., and who was then 60 years of age. He was born at Naples, and deemed to be an excellent civilian and canonist, and a person of great probity. He was exemplary in his attention to the forms of devotion, and singularly humble and modest in his demeanour. The cardinals apprehended that he would renounce an election that had been the result of force; but this was far from being his intention. He began with reproving the cardinals for their culpable qualities, and with urging them to reform their conduct; and at the same time he ingratiated himself with the Roman people. The cardinals were incensed by the haughty spirit which he manifested, and determined upon making void his election. For this purpose they withdrew to Anagni, and from thence sent an admonition to Urban to resign a dignity to which he must be conscious he had no title. When they found that their admonition was unavailing, they proceeded to a new election, under the protection of a guard from Viterbo. At length, the ultramontane cardinals, being sixteen, whilst the Italian were no more than four, pronounced, in August 1378, a sentence of nullity against the election of Urban, and of excommunication against his person. The Italian cardinals afterwards joined them; and they concurred in chusing for a new pope cardinal Robert, brother of the count of Geneva, and allied to most of the royal houses of Europe. He assumed the name of Clement VII.

The countries of Europe were divided between these two popes: Urban being acknowledged in Italy and the greatest part of Germany, England, Portugal, Hungary, Poland, Denmark, Sweden, Prussia, and Norway; and Clement possessing France, Spain, Scotland, Sicily, Rhodes, and Cyprus.

Cyprus. Each of these claimants was adhered to and supported by men of learning and reputation. The former resided at Rome, and the latter at Avignon. We shall not detail the contests, no less disgraceful to the one than to the other, by which these competitors for ecclesiastical power and their respective adherents maintained their authority and influence. One of Urban's last acts was that of reducing the period of the Jubilee from every 50th to every 33d year. He closed a very unquiet pontificate of 11½ years, and a life of atrocious misconduct, in October 1389. Notwithstanding the apparent irregularity of his election, the church has sanctioned it as canonical, enrolled him among the true popes, and referred his rival to the class of anti-popes. Dupin. Bower.

URBAN VII., *Pope*, succeeded Sixtus V. in September, 1590, and died on the twelfth day of his pontificate. Bower.

URBAN VIII., *Pope*, named *Maffeo Barberini*, was born of a noble Florentine family in 1567, educated in Florence and the Jesuits' college in Rome, and graduated in law at Pisa. He was well acquainted with the Latin, Greek, and Hebrew languages, and became a prelate by powerful interest at the age of 19 years. Under the patronage of Clement VIII. he sustained many offices of distinction; was made cardinal by Paul V. in 1606, and elevated to the pontificate on the death of Gregory XV. in 1623. Immediately upon his elevation, he created two of his nephews cardinals, and conferred the title of eminence upon all of that order. On the death of the duke of Urbino, in 1632, he took possession of that duchy, as a fief of the holy see. Of the part which this pontiff took in the controversy that prevailed with respect to the doctrines of Jansenius, we have already given a brief account under the article JANSENISM. Among his other pontifical acts we may mention his approbation of the order of the Visitation, and his suppression of that of the Jesuitesses. He also issued a bull for renewing the decrees of the council of Trent, and of other popes, which enjoined the residence of prelates on their sees. Having, at the instigation of his nephews, entered into a war with the duke of Parma, from whom he had ravished, in 1641, the duchy of Castro, as a forfeiture to the holy see, which he was afterwards obliged to restore, on condition of obtaining peace, he died in 1644, in the 77th year of his age, and the 21st of his pontificate. His character, excepting only the charge of nepotism, which he incurred in common with many other pontiffs, was upon the whole respectable. He was a scholar, and an encourager of literature. Of his poems a magnificent impression was published, during his life, at Paris, in 1642, under the title "Maphæi S.R.E. Carl. Barberini nunc Urbani VIII. Poemata." He also corrected and rendered more pure and elegant the Latin hymns used in divine service. Among other splendid buildings, which he caused to be erected in the capital, one was the palace of Palestrina, for the residence of a nephew, whom he made prince with that title. By stripping the brass from the roof of the Pantheon, in order to decorate the altar of St. Peter's, he furnished occasion for the following pasquinade: "Quod non fecere Barbari, fecere Barberini." His family he had so enriched, that he subjected them to a severe persecution in the subsequent pontificate. Dupin. Bower.

URBANIA, or *Castel Durante*, in *Geography*, a town of the Popedom, in the duchy of Urbino. This town owes its name to pope Urban VIII., who rebuilt it, and surrounded it with bastions. It is the see of a bishop, suffragan of Urbino; 7 miles S.S.W. of Urbino.

URBANNA, a town of Virginia, on the Rappahannoc; 50 miles E.N.E. of Richmond. N. lat. 37° 40′. W. long. 76° 40′.

URBARA, in *Ancient Geography*, a town of Africa, in the interior of Mauritania Cæsariensis. Ptolemy.

URBATA, a town of Pannonia, upon the route from Sirmium to Salone, between Cirtisa and Servium. Anton. Itin.

URBE, in *Geography*, a river which rises in the county of Waldeck, and runs into the Dimel, 5 miles W. of Warburg.

URBIACA, in *Ancient Geography*, a town of Hispania Citerior, at a small distance from mount Ubeda, towards the east, on a small river which ran towards Bilbilis; marked in Anton. Itin. between Valeponga and Albonica.

URBICARY PROVINCES. See SUBURBICARY.

URBICUS, in *Ancient Geography*, a river of Spain.

URBINATES, a people of Italy, in Umbria; of whom there were two classes, *viz.* the Metaurenses, who inhabited the banks of the Metaurus; and the Hortenses, who inhabited the city of Urbinum, near the Flaminian way. The Urbinum Hortense, or town of gardens, was situated on a lofty hill, and had only a fountain to supply the whole town with water. The Urbinum of Metaurus lay south-east of the former, on a river from which it took its name. It was municipal.

URBINO, TIMOTEO DI, in *Biography*. See VITE.

URBINO, *Duchy of*, in *Geography*, a province of the Popedom, bounded on the north by Romagna, on the north-east by the Adriatic, on the south-east by the marquisate of Ancona, on the south by the Perugiano, and on the west by Tuscany and Romagna. The air is reckoned unwholesome; one of the chief productions is silk; game and fish are plentiful. Urbino was formerly governed by its own dukes, of whom the last, Francis Maria, of Rovera, dying in the year 1631, without male issue, the pope took possession of his territory. The said duke had by will, in 1626, confirmed the pope's claims, and already, in effect, made over the country. Victoria, daughter of his son Ubaldi, and spouse to Ferdinand II. great duke of Tuscany, inherited the allodial estates; and hence it is that Poggio Impériale, and other places in this country, belonged to the duke of Tuscany. In the year 1764, the pope purchased the rights claimed by the duke of Tuscany. During the French revolution it was transferred to the kingdom of Italy.

URBINO, a city of the Popedom, and capital of a duchy of the same name, near the head of the Foglio, the see of an archbishop, and residence of a legate. It is situated on a hill, at the union of two rivers. The university or academy is one of the most ancient in Italy. It contains a noble college, and 16 convents. The ducal palace, which at present belongs to the pope, was built by duke Frederic, who furnished it with many ancient statues of marble and bronze, excellent paintings, and a library of curious and rare books. The library was conveyed to Rome by pope Alexander VII. In the churches are seen some works of the celebrated painters Raphael and Frederic Barocci; as likewise of Genga, Vincent St. Geminiano, and Timotheus d'Urbino, pupils of Raphael. Raphael was a native of Urbino; 54 miles E. of Florence. N. lat. 43° 48′. E. long. 12° 32′.

URBI-SAGLIA, a town of the marquisate of Ancona; 5 miles S. of Macerata.

URBS. See KEFF.

URBS, in *Ancient Geography*, a river of Italy, in Liguria.—Also, a forest of Italy, in Liguria, near the fore-mentioned river.

Urbs *Selvia*, a town of Italy, in the interior of Picenum, on this side of the Apennines. Ptolemy.

Urbs *Vetus*, *Orvietto*, a town of Italy, in Etruria, on the river Clanis.

URCAS, in *Geography*, rocks near the coast of Brazil. S. lat. 4° 50'. W. long. 35° 44'.

URCEO, Antonio, (Codrus Urceus, Lat.), in *Biography*, an eminent scholar, was born in 1446, at Rubiera, in the territory of Reggio, in Lombardy; and having been educated at Bologna, and under the famous Guarini at Ferrara, he became, in his 23d year, a teacher of the classics at Forli. At Forli he had for one of his pupils the son of Pino, lord of that place, who having once politely recommended himself to Urceo, the latter jocosely replied, "Good God! how well things go with us! Jupiter recommends himself to Codrus;" referring to the name of a poet in Juvenal, whose poverty was proverbial. From this circumstance he obtained the appellation of Codrus. The loss of some written paper, and of an opera entitled "Pastor," by fire, roused his passion to such a degree, that he vented his rage by uttering the most horrid blasphemies, and hurrying into a wood near the city, where he remained a whole day without food. Upon his return the gates were shut, and he was obliged to pass the night upon a dunghill. In the morning he repaired to the house of a carpenter, and remained there in a state of melancholy for six months; but he afterwards resumed his occupations till the death of Pino. Upon this event disturbances occurred in the city, which occasioned him, after a residence of 13 years, to remove to Bologna, where he taught grammar and eloquence with great applause. His disregard of religion, however, and the freedom with which he expressed his doubts concerning a future state, rendered it necessary for him to engage the protection of the most reputable citizens. Notwithstanding the scepticism and irreligion of his life, he had recourse, at his death, to the sacraments of the church, which he received with tokens of deep contrition. He died in the year 1500, much regretted by his disciples, who carried his remains to the place of interment. His distinguished reputation, as one of the most learned Greek and Latin scholars in his time, has been testified by his contemporaries, and particularly by Angelo Poliziano and Aldo Manuzio. His works, consisting of Latin letters, orations, and poems, and of a supplement to the "Aulularia" of Plautus, were published at Bologna in 1502, and have been often reprinted; but they are thought inadequate to the reputation which he had acquired during his life. Moreri. Bayle. Gen. Biog.

URCEOLARIA, in *Botany*, a genus of the tribe of Lichenes, (see that article,) established and named by Acharius, from *urceolus*, a little pitcher, in allusion to the form of the shields, sunk, like little depressed cups, deep into the substance of the crust.—Achar. Prodr. 30. Meth. 141. "Lichenogr. 74. t. 6. f. 8, 9. 11." Syn. 137. Sm. Prodr. Fl. Græc. Sibth. v. 2. 305.—Class and order, *Cryptogamia Algæ*. Nat. Ord. *Algæ*, *Lichenes*.

Eff. Ch. Receptacles shield-like, concave, coloured, smooth, sunk in the crust; their surrounding margin elevated, sessile, of the colour and substance of the crust.

Acharius remarks, in his *Methodus* above cited, that the present genus is, as it were, intermediate between his *Lecidea* and *Parmelia*, being distinguished from both by the uniformly concave, as well as sunk, shields, which moreover are most frequently furnished with a proper, as well as accessory, margin. The former indeed, never present in *Parmelia*, is not very evident in *Urceolaria*, being small, and of the same colour as the disk: the latter, never observable in *Lecidea*, is in *Urceolaria* an annular elevation of the substance of the crust, overtopping the margin of the shield.

Twenty species are defined in the *Synopsis* of Acharius, whose synonyms appear, in some instances, not correctly applied; but we are well aware of the great ambiguity attending the plants in question, and shall propose our doubts with caution. Few of these species are known in England, most of them being either of Swiss or Lapland origin. They frequently grow on hard stones, that are occasionally inundated, or on naked exposed rocks; sometimes on the bark of trees. They are, for the most part, of small dimensions, and of rather inconspicuous appearance. We select the most remarkable.

U. *Acharii*. Acharian Urceolaria. Ach. Syn. n. 1. Meth. 150. (Lichen Acharii; Ach. Prodr. 33. with a figure in the title-page. Engl. Bot. t. 1087. L. lacustris; With. v. 4. 21. t. 31. f. 4.)—Crust limited, smooth, a little cracked, pale brick-coloured. Shields red; accessory border tumid.—Found on large stones, of the hardest kinds, that border alpine lakes or rivulets, in Sweden, Wales, &c. and are inundated in winter. Mr. Griffith first noticed this species in Britain, and the name *lacustris*, under which it appeared in Dr. Withering's work, is so very excellent, that nothing but the claims of our illustrious friend Acharius could induce us to resign it. The *crust* looks like an ochraceous sediment from the water, but is hard and firm, inseparable from the rock, smooth and even, as if partly polished, or rubbed down, becoming cracked with age. Its colour is a pale yellowish-brown, rarely a dirty white. *Shields* small, variously scattered, of the diameter of a small pin's head, concave, sunk, of a deeper redder hue than the crust, surrounded at first by a pale elevated border from the crust, which subsequently disappears, probably from the smoothing action of the water. Dr. Acharius gives, as a variety of this, the *Lecanora cyrtaspis* of his *Lichenographia*, p. 397, for which he quotes *Lichen punctatus*, Engl. Bot. t. 450. We cannot conceive the latter to be an *Urceolaria*, or to be even allied to the species before us. It seems a *Parmelia*, whose crust is white or greenish, not reddish, nor is the disk of the shields concave, nor bordered. Though greenish, or brown when young, that part is finally black. We do not mean to insist on the synonym of *Fl. Dan. t.* 468. *f.* 2.

U. *diamarta*. Red and black Urceolaria. Ach. Syn. n. 2. Meth. 151. ("Lichen diamartus; Wahlenb. Lapp. 414.")—"Crust somewhat limited, cracked, rather warty, of an ochrey-red. Disk of the shields rather convex, black; accessory margin elevated, finally zigzag."—On rocks near the shore of the gulf of Bothnia. Dr. Acharius declares this to be a widely different species from *Endocarpon sinopicum*, with which, he says, "it seems to be confounded in Engl. Bot." At p. 1776 of that work we have, indeed, mentioned a suggestion of Mr. Turner's, that these two plants may probably prove one and the same. But we presume there is no error or confusion in the figure and description annexed of our *Lichen sinopicus*, which we found to agree with Mr. Wahlenberg's original specimen of his *Endocarpon* so called. Of the *Urceolaria* in question, we have never seen a specimen, unless it be *Lichen Oederi* of Dickson, as hinted by Acharius in his *Methodus*, 152; but this is not given as a synonym in the *Synopsis*.

U. *gibbosa*. Tumid Urceolaria. Ach. Syn. n. 7. Meth. 144, excluding the syn. of Bellardi and Viliars. (U. fimbriata; Ach. Meth. 145. Lichen fibrosus; Engl. Bot. t. 1732.)—Crust covered with papillary warts, smoothish, of a light smoky brown; the edge more or less fibrous. Shields in the summit of each wart, concave, blackish; accessory

cessory margin elevated, contracted, pale, minutely crenate.—Found on exposed rocks and stones, in various parts of Europe. On the smooth flints scattered over the downs of Sussex this species appears in its greatest perfection; sometimes having a fine radiating marginal fringe, by which the crust extends itself; the central part being occupied, frequently to the breadth of two or three inches, with crowded, angular, elevated, convex warts, of a grey or brownish hue. These are less distinct, and more polished, towards the circumference, where they vanish into a thin, dilated, inseparable border, often more granulated than fibrous, except where the flint is broken and polished. Each of the perfect warts bears one, rarely more than one, small, irregular, concave *shield*, whose disk is blackish, somewhat glaucous, internally reddish-brown, encompassed by a pale, roughish, raised margin, which looks as if it had become visible by rubbing. When the plant has its fringed edge, it is the *U. fimbriata* of Acharius, now justly reduced by that intelligent author to his own *gibbosa*.

U. *cinerea*. Ash-coloured Urceolaria. Ach. Syn. n. 11. Meth. 143. (Lichen cinereus; Linn. Mant. 132. Westring Lich. v. 1. 247. t. 18. Ach. Prodr. 32. Verrucaria ocellata; Hoffm. Pl. Lich. v. 1. 92. t. 20. f. 2.)—Crust grey, rugged and cracked, with a black border. Shields black, sunk, slightly concave; at length elevated along with their prominent, thickish, entire, accessory margins.—Common on large stones, rocks, and scattered flints. Few Lichens have been less understood, nor would Linnæus's specific name have been changed, probably, if botanists had been able to ascertain, with any certainty, what he intended by it. His herbarium gives no information on this subject; but we rely with confidence on the tradition of his Swedish pupils. The general appearance of this species is like a bad imperfect state of Hudson's *Lichen ater*, but the latter is not an *Urceolaria*. The *crust* is thin and inseparable; its edge, when crowded and condensed, narrow and black; but when allowed to spread on smooth flints, it is more dilated, zoned, and greenish, not fibrous. The central part swells into small, irregular, grey knobs, and at length cracks. The copious *shields* are either solitary or clustered, small, black, with the decided accessory border of this genus, growing more and more above the common level. According to the experiments of Mr. Westring, this species affords very fine rich shades of orange, or red-brown, for dyeing silk. Acharius indicates four varieties, chiefly described by himself, which we have had no opportunity of comparing.

U. *scruposa*. Powdery Spherical Urceolaria. Ach. Syn. n. 13. Meth. 147. (Lichen scruposus; Schreb. Lipf. 133. Hoffm. Enum. 41. t. 6. f. 1. Dicks. Crypt. fasc. 1. 11. Engl. Bot. t. 266. Lichenoides crustaceum et leprosum, scutellis nigricantibus majoribus et minoribus, varietas β; Dill. Musc. 133. t. 18. f. 15, β. Patellaria scruposa; Hoffm. Pl. Lich. v. 1. 54. t. 11. f. 2.)—Crust corrugated, greyish-white, granulated, mealy. Shields nearly spherical, black, with a tumid, inflexed, narrow-mouthed, finely crenate accessory border.—Frequent on dry chalky heaths, and on brick walls, sometimes on rocks, or spreading over decayed mosses. The *crust* is thick and chalky, mostly cream-coloured, or greyish; very white when dry, almost covered with the crowded globular warts, each of which lodges a blackish, or slightly glaucous, hollow *shield*, of the same shape. *Lichen impressus*, Ach. Prodr. 104. (Patellaria muscorum; Hoffm. Pl. Lich. v. 1. 93. t. 21. f. 1.) is acknowledged to be a variety of this, whose crust assumes a leafy appearance from other plants which it overruns.

U. *diacapsis*, Ach. Syn. n. 15. (Lichen diacapsis; Engl. Bot. t. 1954.) is surely a *Lecidea* of Acharius, having nothing of an accessory border to the shields.

U. *calcarea*. Chalky Urceolaria. Ach. Syn. n. 16. Meth. 142. t. 4. f. 1. (Lichen calcareus; Linn. Fl. Suec. ed. 2. 407. L. cinereus; Engl. Bot. t. 820. Verrucaria contorta; Hoffm. Pl. Lich. v. 1. 97. t. 22. f. 1—4.)—Crust limited, finely cracked, somewhat powdery, very white; at length greyish. Shields minute, irregular, concave, greyish-black, with a thin edge, and a slightly prominent accessory border.—Found on calcareous rocks and wrought stones. The plant of English Botany forms broad conspicuous inseparable patches, on grey-marble tomb-stones, in the country church-yards of Norfolk and Suffolk. Dr. Acharius determines it to be the *Lichen calcareus* of Linnæus, to whose description and remarks it well answers, especially where he says that it is a sure indication of calcareous stones, and proves very troublesome to the decypherers of runic inscriptions. The *crust* is extremely hard and solid. The form of the *shields* is scarcely ever exactly circular. Whether *U. Hoffmanni*, Ach. Meth. 145, *Lichen rupicola*, Hoffm. Enum. 23. t. 6. f. 3, be the same species, or whether the eight other varieties, adopted by Acharius chiefly from Florke in the Berlin Magazine for 1811, belong to it, we are equally, at least, in doubt with himself. *Patellaria multipuncta*, Hoffm. Pl. Lich. t. 63. f. 1—3, we now agree with Acharius in separating from the present species. He makes it a variety of *Lecidea albo-cærulescens*, Ach. Syn. 29, which is Dickson's *Lichen pruinatus*; but we presume here to express our doubts.

U. *compuncta*. Many-dotted Urceolaria. Sm. in Ach. Meth. 143. Syn. n. 19.—Crust continued, very thin, smooth, greyish-white. Shields numerous, crowded, minute, concave, black, white-edged, with a tumid accessory border.—Found by the late Mr. Christ. Smith, on the bark of trees in Amboyna. The *crust* appears to be divided into tessellated portions, but these are rather cracks in the bark, to which its thin uninterrupted substance exactly conforms. Each portion contains innumerable cavities, as if made with the point of a needle, every one of which lodges a minute blackish hollow disk, whose proper margin, unconnected with the accessory one, is contracted, and very pale, almost white. We can assure our worthy friend Acharius, who has relied on the writer of this for the present curious species, that, notwithstanding his doubts, nothing can be more unlike *U. calcarea*.

U. *esculenta*. Eatable Urceolaria. Ach. Syn. n. 20.—"Crust tartareous, thick, rugged and warty, greyish. Receptacles wart-like, with a hollow disk."—Native of the chalky hills, of the deserts of Tartary. The *crust* is eatable! Acharius appears never to have seen a specimen, and he is not certain of the genus. He quotes no authority.

URCEOLUS, in *Ecclesiastical Writers*. See AQUÆMANILIS.

URCEOLUS, in *Mythology*, a small vase of brass, silver, earth, or some other material, which had a straight neck, and wide mouth, much after the fashion of the burettes, or crystal bottles in which they put the wine and water used in the sacrifice of the mass, which the inferior ministers carried for washing the priest's hands. They are often to be found upon antique monuments, in the hands of their ministers.

URCESA, in *Ancient Geography*, a town of Hispania Citerior, belonging to the Celtiberi.

URCEUS, in *Antiquity*, the name of a measure of liquids, which in different places was of different capacity; its most usual

usual standard seems to have been between twelve and sixteen ounces.

URCHIN, a common name given to the hedge-hog.

URCHIN, *Sea*, in *Ichthyology*. The *echinus marinus* of authors is, in some parts of England, called the *sea-egg*, and in others the *sea-urchin*, or *hedge-hog*. It is a genus of fish, of which there are a great number of species. See ECHINODERMA, and CENTRONIA.

The manner of these creatures moving at the bottom of the sea has been disputed among naturalists; the general opinion of the world has been, that they did it by means of their spines or prickles, which served them by way of legs; but some of late, particularly Mr. Gandolphe, pretend that the spines of the urchins are of no use to them on this occasion, but that they move by means of certain legs, like the legs of the star-fish, which they occasionally put out when they walk, and at other times retract them into their body. The world was readily falling into this system, particularly as Mr. Gandolphe affirmed, that he had been often an eye-witness to it; but the indefatigable M. Reaumur tried the experiment himself, and often made himself an eye-witness of the contrary fact, having frequently seen them walk at the bottom of a shallow bason of sea-water, with no other assistance than that of their spines, and even having made them perform the same motion, by the same means, upon his hand.

This curious inquirer into nature did not, however, stop here; but took occasion from hence to inquire accurately into every circumstance of their progression, which is performed by so uncommon means.

It is certain that the sea-urchin does throw out at the lower aperture of the shell, when it pleases, certain bodies which resemble not a little the legs of star-fish; but these serve not at all to its motion; but, on the contrary, their real use is to keep the creature still, and fixed in the same position; and, to describe them more exactly, they very aptly resemble the horns of snails; whence M. Reaumur has chosen rather to call them horns than legs. The use the urchin makes of these horns, while it is in motion, is to feel about, and try the ground on which it marches; and they serve the creature as a staff does a blind man in his walking, to touch and try every thing that lies in the way; and to make them serve to this purpose, it is continually extending or retracting them during the time it is moving. These horns are not only placed about the orifice of the shell, but they are every where dispersed among the spines, all over the surface of the shell.

In order to understand the position of these horns, we must consider, that the sea-urchin shell is a hard body, approaching in form to that of a segment of a sphere, with two apertures, one commonly at the summit of the shell, and another opposite to it at the base: the former hole serves, as it is supposed, for discharging the excrement, and the latter for the mouth of the animal. The whole external surface is divided by protuberances, of different sizes, into ten spherical isosceles triangles, which have their vertex at the upper aperture, and their base at the lower: five of these are large and five small; the larger are separated from the smaller by triangular bands pierced with small holes, arranged in a beautiful and regular order. The triangular spaces are divided by several lines, commencing at the upper aperture of the shell, and terminating at the lower; these lines are marked by sundry eminences of different sizes, each of which resembles a sort of nipple: on these parts the base of every spine is fixed, and as the base is hollow, it is able to turn round each eminence. Of these species M. Reaumur found more than two thousand on every fish; and the number of perforations on each shell is not less than thirteen hundred. From each of these perforations, there proceeds a horn, which horns are only visible when the fish is in the water, and even then it puts forth only some of them at once: these serve as anchors to the fish, because it glues them fast to the stones, &c.

The spines are all capable of assisting the creature in its motions, but those it principally employs are such as are placed near its mouth; as these can turn upon their balls every way with equal facility, the creature finds it equally easy to move on any side; and when it has determined which way it will move, those spines which stand directly toward that point, and those which are directly opposite, are of equal service to it; it draws itself forward by means of the first, and pushes itself on with the others; to do this, it first thrusts out the foremost ones as far as possible, and pressing them against the bottom, it draws on its body by them; and this is succeeded, by drawing up the hinder ones close to its shell, and then fixing them against the bottom, it pushes itself forward by them. This is the manner of this little creature's marching in the common way, with its mouth downward; but it has this strange singularity, that it is not confined to this posture alone in marching, but can, with equal ease, walk with its mouth upwards, or run along sideways in the manner of a wheel; or in any direction between these. The legs and the horns cover all parts of it, and are in every part of it equally able to move separately thirteen hundred horns, and more than two thousand spines, which serve for legs. Mem. Acad. Par. 1712.

URCI, in *Ancient Geography*, a town of Hispania, in Bœtica, at the mouth of a river, on the frontiers of the Tarragonensis of Bœtica.

URCINIUM, a town situated on the coast of the island of Corsica, between Rhium Promontorium and Arenosum Littus. Ptolemy.

URCIZE, ST., in *Geography*, a town of France, in the department of the Cantal; 21 miles S. of St. Flour.

URCOS, a town of Peru, in the diocese of Cusco; 20 miles S. of Cusco.

URCUNAZO, a river of Spain, which runs into the Orio, in the province of Guipuscoa.

URDACHE, a town of Spain, in Navarre; 22 miles N. of Pamplona.

URDASIM, a river of Russia, which runs into the Ural, at Fort Tanalitzkaia.

URDASIMSKAIA, a fort of Russia, in the government of Upha; 128 miles E. of Orenburg.

URDE', or URDÉE, in *Heraldry*. A *cross urdé* seems to be the same with what we otherwise call *clechée*.

URDIALA, in *Geography*, a town of Spain, in the province of Tavastland; 28 miles W. of Tavasthus.

URE, or YOURE, a river of England, in the county of York, which rises at and passes by Masham, Rippon, Boroughbridge, &c. and about two miles below the last town joins the Swale, and takes the name of Ouse.

URE, in *Rural Economy*, a provincial term sometimes applied to the udders of particular sorts of domestic animals, as those of cows, sheep, and some others. See UDDER.

UREA, or URE'E. Fourcroy and Vauquelin gave this name to a principle contained in human urine, which, in combination with many others, Rouelle junior first pointed out so early as 1773; and the description of these celebrated chemists, and that of Mr. Cruickshanks, who examined it about the same time, have been generally adopted by succeeding writers, with one or two exceptions only, even to the

the present time. Berzelius appears to have been the first who obtained it in a separate state, but the account he has given of it does not seem to have much attracted the attention of chemists, for the more recent description of it by Thenard is much less correct. M. Vauquelin is said to have procured it very lately in the pure state in which we are about to describe it, which description we adopt from Dr. Prout, who has just published an account of this singular principle in the Transactions of the Medico-chirurgical Society of London.

To obtain urea in any quantity is no easy task. This arises from the care with which it is decomposed, and the obstinacy with which the colouring matter, and other urinary principles, adhere to it. Dr. Prout recommends that urine should be carefully evaporated to the consistence of a syrup; that nitric acid should be slowly added to it in this state, which combines with the urea, and thus separates it from many other principles. The nitrate of urea is then to be decomposed by carbonate of potash, and after the nitre formed has been separated by crystallization, animal charcoal is recommended to be added to the coloured solution of urea, which separates most of the colouring matters: lastly, the solution of urea is again ordered to be evaporated to dryness, and heated with strong alcohol and heat; the alcoholic solution thus formed is then to be concentrated by evaporation, and on cooling the urea separates from it in a pure crystalline state. Thus obtained, urea has the following properties:

"Urea most frequently assumes the form of a four-sided prism. Its crystals are transparent and colourless, and have a slight pearly lustre. It leaves a sensation of coolness on the tongue like nitre. Its smell is faint and peculiar, but not urinous. It does not affect litmus or turmeric papers. It undergoes no apparent change on exposure to the air, except in very damp weather, when it slightly deliquesces, but does not seem to suffer decomposition. Exposed to a strong heat it melts, and is partly decomposed and partly sublimed apparently unaltered. The specific gravity of its crystals is about 1.350.

"Water at 60° dissolves more than its own weight of urea, and the solution exposed to the air for several months underwent no change. Boiling water dissolves any quantity of it whatever, and the urea does not appear to undergo any change at this degree of temperature.

"Alcohol (sp. gr. .816) at a mean temperature dissolves about 20 *per cent.*, and at a boiling temperature more than its own weight, and the urea separates on cooling in the form of crystals. It is very sparingly if at all soluble in sulphuric ether, or the essential oil of turpentine, though these fluids are rendered opaque by it.

"The pure alkalies and alkaline earths decompose it, especially when assisted by heat, and the result is chiefly carbonate of ammonia. It unites with most of the metallic oxyds. The combination with silver is greyish, and detonates on being heated, and the silver is reduced. It does not seem however to be alone capable of decomposing any metallic salt, but in order to effect the union in question the aid of double decomposition is necessary.

"It combines with nitric acid, and forms a crystalline compound but sparingly soluble in water. It forms also a similar compound with oxalic acid. In neither of these compounds are the properties of the acids neutralized."

Urea has the remarkable property of changing the crystalline forms of those salts with which it is in solution. Thus the cubical form of the muriate of soda is changed into an octohedron, while the octohedral form of the muriate of ammonia is converted into a cube. The prismatic form of nitre also is liable to be variously modified. These changes do not appear to take place unless the urea be in excess in a solution, and the proportional quantities of the different salts be such as to crystallize slowly.

Urea submitted to analysis, by combustion with the oxyd of copper, was found to consist of

2 atoms or 2 volumes of hydrogen	2.5	or *per ct.* of	hydrogen	6.66
1 atom or 1 volume of carbon	7.5		carbon	19.99
1 atom or ½ volume of oxygen	10.0		oxygen	26.66
1 atom or 1 volume of azote	17.5		azote	46.66
	37.5			100.00

The nitrate of urea, the crystalline compound before-mentioned, consists, according to Dr. Prout's analysis, of

Nitric acid	47.37	or one atom.
Urea	52.63	or two atoms.
	100.00	

Hence we are enabled, by means of this analysis, to estimate the quantity of urea in a given specimen of urine.

Urea sometimes exists so abundantly in urine, as to crystallize spontaneously on the addition of nitric acid. In such instances it is usually accompanied by an excess of the phosphates. A remarkable relation was found by Dr. Prout to subsist between urea and the saccharine principle, which, in his opinion, satisfactorily explains the phenomena of diabetes, a disease in which sugar is known to be present in the urine, in the proportion in which urea is absent. Another remarkable circumstance is, its composition being in conformity to the atomic theory, or theory of definite proportions. This however is not peculiar to urea, but was found by Dr. P. to hold good in other urinary principles. See Uric *Acid*.

URECOURT, in *Geography*, a town of France, in the department of the Vosges; 6 miles N.N.W. of La Marche.

UREDEN, a town of Germany, in the bishopric of Munster, on the Berckel; 26 miles W.N.W. of Munster.

UREDO, a word used by some of the chemical writers to express the virtues of metals communicated to them from the sun. Pliny uses the same word to express the smut affecting fruits; and some medical writers have expressed by it a very violent and excruciating pain in the head: and others an extreme itching or burning in the skin. See Smut, Blast, and Blight.

Uredo, in *Botany*, an old Latin name, from *uro*, to burn, or parch, applied to those occasional discolorations on the surfaces of plants, which were attributed to blasts, or injuries of the atmosphere or heavenly bodies, but which are now generally found to be parasitical *fungi;* at least such is the state of these appearances, when they come under our observation, whatever injury or disease, in the plant which bears them, may have favoured their production. The above name is now applied to one particular genus of this kind of vegetable.—Perf. Obf. Mycol. fasc. 2. 23. Syn. Fung. 214.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eff. Ch. Coat none. Powder naked, deciduous. Seeds uniform, generally globose.

Such is Persoon's generic character, by which the difference between this genus and another of the same author's, named *Puccinia*, seems to be, that in the latter what he terms, with a mark of doubt, *Sporulæ*, seeds, are said to be clustered

clustered into little tufts, roundish, and somewhat turbinate, with a tail, or elongation at the base, and interrupted by internal partitions. What are analogous to these in *Uredo* are said to be "uniform, generally globose." This distinction is clear enough, but the denomination of the parts in question proves erroneous. This is evident from the elaborate investigation of the blight in wheat, by the right hon. sir Joseph Banks, illustrated by the microscopic drawings of Mr. Francis Bauer, republished in Sims and Konig's Ann. of Bot. v. 2. 51. t. 3, 4. By this treatise, and indeed by Persoon's own definition, it is manifest, that his *Sporulæ* are not *seeds*, but real seed-vessels, or *capsules*. Therefore the *Uredo frumenti*, Sowerby's Fung. t. 140. Lambert in Tr. of Linn. Soc. v. 4. 193. Kirby ibid. v. 5. 122, which was the subject of sir Joseph Banks's examination, and is the *Puccinia graminis* of Persoon, Syn. Fung. 228, rather answers to the character of the genus *Licea* in the same work, p. 195, given as follows: "Head distinct, roundish or somewhat indeterminate, brittle, without any subjacent membrane. Seminal powder destitute of threads." We know not what is meant, in Persoon's generic character of *Uredo*, by the distinction between *pulvis*, powder, and *sporulæ*, seeds, nor whether the latter, if examined with equal care, might prove, as in the *Uredo frumenti*, to be *capsules*. The subject indeed is in its infancy. Mr. Bauer has long been collecting facts and appearances to illustrate it, which are registered in his inimitable drawings, but materials are not yet sufficiently plentiful to form therewith any systematic arrangement of these minute productions, in which the greatness of the Creator, and our own ignorance, have long been acknowledged. Nevertheless, we are obliged to those who have made any scientific attempt at defining this cryptogamic tribe, for present convenience, however imperfect such must necessarily be. In this light Persoon shines conspicuous, and we shall extract what will best illustrate his genus *Uredo*. The subject is important in an agricultural view, some of these parasitical *fungi* being supposed, at least, to be very detrimental to the corn, or other plants, on which they grow. We are rather disposed to believe that the effect has generally been mistaken for the cause, and that an injury to the corn, from cold or wet, has merely disposed it to afford nourishment for the *fungi*. This, however, is a theoretical question, not necessarily connected with the botanical part of the subject.

Persoon defines 30 species of *Uredo*, disposed in four sections, according to the colour of the apparent powder; whether that powder be naked *seeds*, or, as there is reason to suppose, from the above observations, a congeries of excessively minute *capsules*.

Sect. 1. *Powder yellowish.* RUBIGO; 16 species.

U. *mycophila*. Mushroom Blight. Perf. n. 1. (Mucor chrysospermus; Bulliard Fung. v. 1. 99. t. 504. f. 1, and t. 476. f. 4. With. v. 4. 402.) — Widely spreading, extremely fine, yellow; seeds solitary or aggregate, on capillary stalks, simple or branched.—Found covering the whole surface of several kinds of *Boletus*, which grow in shady places, and even penetrating their substance, in the form of an apparently impalpable yellow powder, staining the fingers when touched; in August and September, Dr. Withering says, it powerfully repels wet, like the seeds of a *Lycopordium*, a specimen in his possession not being moistened, though immersed in a fluid for a year. Persoon remarks, that this species rarely occurs on any Agaric, and that the *Boleti* attacked with it are not fully expanded before they languish and rot, being at first involved in a white evanescent downiness, and then copiously impregnated with the above bright yellow powder, which Bulliard compares to the pollen of a lily.

U. *Alchemillæ*. Ladies'-mantle Blight. Perf. n. 3. Obs. Mycol. fasc. 1. 98.—Crowded, yellow, breaking out into nearly parallel lines. — On the leaves of *Alchemilla vulgaris*, especially in mountainous situations; common in the Hartz forest. The leaves which bear this parasite are much smaller than usual. The *powder* is nearly orange-coloured, in ovate, elliptical, or more frequently linear spots, like the fructification of an *Asplenium*. *Persoon*.

U. *Euphorbiæ helioscopiæ*. Spurge Blight. Perf. n. 4.— Scattered, nearly globular, prominent, yellow. — Frequent in summer on the plant mentioned, which when so occupied has always a pale sickly aspect; but whether in consequence of the presence of the fungus, or whether the latter attaches itself to weak plants only, we know not. The spots are various in size, deep yellow, prominent like warts. A smaller variety, more regular in shape, is found on *E. exigua*.

U. *linearis*. Long linear Blight. Perf. n. 7. (U. longissima; Sowerb. Fung. t. 139.)—Linear, parallel, very long, yellow, staining; at length of a darker hue. — Observed by Mr. Sowerby, on the leaves of *Poa aquatica*. Persoon says, it is abundant in summer on the straw and leaves of barley, oats, and rye, but he suspects it may be the early stage of his *Puccinia graminis* above mentioned. If so, the epithet "staining" is not applicable. The same author indicates a smaller and paler variety, found rarely on the stalks of *Polypodium fragile* of Linnæus.

U. *Rubi fruticosi*. Bramble Blight. Perf. n. 11.—Minute, nearly globular, powdery, bright yellow, deciduous. —On the leaves of brambles, not uncommon. Persoon justly observes, that the powdery balls of this species are so slightly attached to the leaf, that, when a branch is gathered, they fly off, as it were elastically, if perfectly ripe.

U. *Rubi Idæi*. Raspberry Blight. Perf. n. 12. Obs. Mycol. fasc. 2. 24.— Scattered, yellow, somewhat conical, breaking out in curved lines. — On the upper surface of raspberry leaves, towards the margin, where it forms curved crowded lines, resembling the receptacles of an umbilicated Lichen, *Gyrophora*, of a pale whitish hue. In an advanced state the *powder* is brownish.

U. *Tussilaginis*. Colt's-foot Blight. Perf. n. 13.—Scattered in somewhat concentric, reddish-orange, dots; at length confluent.—Common in autumn on the leaves of colt's-foot, which it finally covers with orange powder entangled among the pubescence. This often disappoints those who are searching for the equally common *Aecidium Tussilaginis*, (*Lycoperdon epiphyllum* of Linnæus,) found on the under side of colt's-foot leaves, in the form of orange dots, crowded together, each with its own white notched *volva*. But these two *fungi* are very distinct, though young botanists sometimes suppose one changes to the other.

Sect. 2. *Powder brown, bay, chesnut, or somewhat blackish.* NIGREDO; 8 species.

U. *Suaveolens*. Sweet-scented Blight. Perf. n. 19. Obs. Mycol. fasc. 2. 24.—Confluent, fragrant, unequal. Powder pale brownish-purple.—Frequent in summer on the leaves of *Gnicus arvensis*, (*Serratula arvensis* Linn.) which, according to Persoon, is thus rendered barren. The leaves attacked, at first assume a thickened or succulent appearance, marked with little blackish dots, or round tubercles, and exhale a pleasant scent. When the fungus arrives at maturity, a bright brown powder takes place of these tubercles, and spreads over the surface of the leaf.

U. *Viciæ Fabæ*. Bean Blight. Perf. n. 20. Disp. Meth. Fung. 13.—Crowded, orbicular, or partly irregular, depressed. Powder brownish-chesnut. — Plentiful on the stem, and especially on the leaves, of the common bean.

U. *bullata*.

U. *bullata.* Tumid Blight. Perf. n. 22. Obf. Mycol. fafc. 1. 98. t. 2. f. 5. and t. 5. f. 9, *b.*— Prominent, bladdery. Powder chefnut-coloured. Seeds conftricted in the middle. — Rarely met with, on the ftems of umbelliferous plants. The cuticle on the ftem is raifed in the form of an ovate bladder, enclofing a tumid mafs of orange-brown *powder*, each particle of which appears, under a very high magnifier, like the figure of 8, as if formed of two rounded lobes.

U. *Anemones.* Anemony Blight. Perf. n. 24. Difp. Meth. Fung. 56.—Rather large, depreffed, burfting from a longitudinal fiffure in the cuticle of the leaf. Powder copious, black.—Found in the fpring, on curled leaves of *Anemone nemorofa*, in whofe fubftance it is lodged.

Sect. 3. *Powder white.* ALBUGO; 2 fpecies.

U. *candida.* Cream Blight.—Shapelefs, tumid, white. Frequent throughout the fummer, on the branches and ftalks of Shepherd's Purfe, which appear greatly fwollen, twifted, abounding with whitifh fœtid powder, which burfts irregularly through the fhining cuticle. Perfoon thinks it grows along with his *Botrytis parafitica*, Obf. Mycol. fafc. 1. 97. t. 5. f. 6, *a, b.*— He notices two varieties, one found on different fpecies of *Tragopogon* in fummer, which is fmaller and more depreffed than the above, with lefs prominent powder; the other on *Alyffum calycinum*, fmaller and roundifh, though variable in fhape.

U. *Cheiranthi.* Stock Blight. Perf. n. 26.— Scattered, nearly globular, prominent, white.—Found rarely on the foliage of *Cheiranthus incanus*. This, which we have never chanced to meet with, is defcribed by Perfoon as confifting of fmall globular maffes, half a line in breadth, each encompaffed with the torn cuticle of the leaf. On account of this difference of form, he thought proper to diftinguifh the prefent fpecies from all the varieties of the laft.

Sect. 4. *Powder blackifh or brown, parafitical on the parts of fructification of different plants.* USTILAGO; 4 fpecies.

U. *Segetum.* Corn Blight, or Smut. Purfh. n. 27. Bulliard Fung. v. 1. 90. t. 472. f. 2.—Powder copious, black, produced within the glumes of graffes. This generally appears like a transformation of the fubftance of the feed, in whole ears of barley, wheat, or oats, or even *Agroftis*, into a fœtid footy powder, and conftitutes the difeafe termed fmut by farmers, concerning whofe caufe, and the means of prevention by fteeping the feed-grain in lime-water, &c., fo many various opinions have been held. See SMUT.

U. *Caricis.* Carex Blight. Perf. n. 28.— Powder black, naked, encompaffing the feeds.— Found on the fruit of different fpecies of *Carex*, as the *montana*, and more efpecially the *pilulifera*, on which laft it is very frequent and confpicuous.

U. *Tragopogi pratenfis.* Goat's-beard Blight. Perf. n. 29. Difp. Meth. Fung. 57.—Powder copious, brownifh-purple, on the receptacles of Tragopogon. This is not uncommon in fummer, on the receptacle of the above plant, within its permanent calyx, and is the largeft of the genus. *Perfoon.*

U. *Violacea.* Violet-coloured Blight. Perf. n. 30. (Farinaria Stellariæ; Sowerb. Fung. t. 396. f. 1.)— Powder of a violet purple, in the anthers of flowers.—Very frequent in *Saponaria officinalis*, *Silene nutans*, *Stellaria graminea*, the white-flowered *Lychnis dioica*, and efpecially *Silene inflata* and *maritima* of Fl. Brit. The *anthers* of thefe flowers often fwell prodigioufly, and their natural contents are replaced by a great quantity of foft dull-purple powder, which ftains the *petals*, and gives the flower the appearance of being fprinkled with fomething like foot. The impregnation of fuch flowers fails, of courfe; but we do not obferve them to be otherwife, as Perfoon declares, languid or fickly. Mr. Sowerby fays, this fungus often burfts from the ripening germen of *Stellaria graminea* and *S. holoftea*; and that it occurs alfo in *Bromus mollis*, which we likewife have remarked, and fome other graffes. Every anther of the fame flower is thus affected. We are much prepoffeffed with the idea of this fuppofed fungus being a difeafe, originating in the conftitution of the plant, and ending in a morbid fecretion; but we muft allow the opinion of Perfoon to be fupported by analogy.

UREGUR, in *Geography*, a town of the ifland of Ceylon; 60 miles N.W. of Trinkomaly.

URELLYCONDA, a town of Hindooftan, in Myfore; 20 miles N. of Bangalore.

UREMA, in *Ancient Geography*, a town of Afia, in Syria, upon the banks of the Euphrates, near Aradus. Ptolemy.

URENA, in *Botany*, from the Malabar name *Uren.* This name, introduced by Dillenius, is allowed by Linnæus, Phil. Bot. 164, among fome others, which, though of barbarous origin, might, as he thought, be new-modelled, fo as to prove not altogether intolerable. We muft allow that the prefent is as little exceptionable in found as any barbarous name can well be.—Linn. Gen. 355. Schreb. 467. Willd. Sp. Pl. v. 3. 800. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 222. Dill. Elth. 430. Juff. 272. Cavan. Diff. 334. Lamarck Illuftr. t. 583. Gærtn. t. 135. —Clafs and order, *Monadelphia Polyandria.* Nat. Ord. *Columniferæ*, Linn. *Malvaceæ*, Juff.

Gen. Ch. *Cal.* Perianth double, inferior. The outer of one leaf, in five broadifh fegments. Inner of five narrow, angular, permanent leaves. *Cor.* Petals five, oblong, broadeft at the extremity, blunt with a point, narroweft at the bafe, which is attached to the tube of the ftamens. *Stam.* Filaments numerous, united in their lower part into a cylindrical tube; feparate above, below the top of the tube; anthers roundifh. *Pift.* Germen fuperior, roundifh, with five angles; ftyle fimple, the length of the ftamens, divided into ten branches at the top, each tipped with a capitate, hairy, reflexed ftigma. *Peric.* Capfule roundifh, with five angles, prickly, of five cells, which finally feparate from each other without burfting. *Seeds* folitary, roundifh externally, compreffed and angular at the oppofite part.

Eff. Ch. Calyx double; the outermoft five-cleft. Capfule of five cells, feparating entire. Seeds folitary. We find much to correct, and fomething to add, in the difcrimination of the fpecies.

1. U. *lobata.* Angular-leaved Urena. Linn. Sp. Pl. 974. Willd. n. 1. Ait. n. 1. Cavan. Diff. 336. t. 185. f. 1. (U. finica, xanthii facie; Dill. Elth. 430. t. 319. Trifolio affinis, Indiæ orientalis, xanthii facie; Breyn. Cent. t. 35.) – Leaves roundifh-heartfhaped, angular, with three glands at the bafe underneath.—Native of China. A greenhoufe fhrub in our gardens, cultivated in the Chelfea and Eltham collections, about the year 1730, but not generally to be met with, being inferior in fplendour to our Wild Mallow, common on every bank. The *flowers* of this *Urena* are neverthelefs of a delicate peach-bloffom hue, and though fhort-lived, lafting but a few hours, are produced in plentiful fucceffion through the fummer. The *ftem* is two or three feet high, erect, not much branched. *Leaves* broader than long, toothed, flightly lobed, finely downy; paler, and rather hoary, beneath. *Footftalks* flender, round, downy, generally longer than the leaves. *Flowers* axillary, folitary, on fhort ftalks, about the fize of *Malva rotundifolia.* *Capfules* near half an inch in diameter, armed with prominent

prominent barbed prickles. We remark with regret, that the erroneous citation of Dillenius, 340 for 430, is copied without correction from Linnæus, by Cavanilles, Willdenow, and even in Hort. Kew., which proves that those authors did not consult the book cited, and therefore greatly weakens our confidence in their authority or judgment, as to critical synonymy, throughout.

2. U. *reticulata.* Reticulated Urena. Cavan. Diff. 335. t. 183. f. 2. Willd. n. 2.—Leaves with a solitary gland at the base beneath, reticulated; the lower ones three-lobed; upper oblong, somewhat fiddle-shaped.—Native of South America. Described by Cavanilles from Lamarck's herbarium. The *stem* is shrubby, a yard high, branched; the *branches* and *footstalks* somewhat downy. The *leaves* are green above; hoary with short down, and reticulated with veins, beneath: the lower ones on longish stalks, like the foregoing, large, deeply three-lobed, their middle lobe longest: the rest narrow and undivided, variously contracted, on short stalks. The midrib of all the *leaves* bears a solitary gland. *Flowers* rather smaller than in the former.

3. U. *tricuspis.* Three-pointed Urena. Cavan. Diff. 334. t. 183. f. 1. Willd. n. 3.—Leaves with three pointed, angular lobes, and a solitary gland at the base beneath. Stem hairy.—Native of the isles of Mauritius and Bourbon. The *stem* is three feet, or more, in height, slender, clothed with copious upright hairs. *Leaves* large, serrated, soft and downy, on hairy stalks. *Flowers* aggregate, at least in the lower part of the plant, yellow.

4. U. *americana.* Fig-leaved Urena. Linn. Suppl. 308. Willd. n. 4. excluding Sloane's synonym. (U. sinuata; Swartz. Obf. 263, but not of Linnæus.)—Leaves three-lobed, rounded and bluntish, much longer than their footstalks; entire and abrupt at the base, with a solitary gland beneath. Stem nearly smooth. Native of Surinam. We have no scruple in removing Sloane's synonym to our following species. His plate by no means expresses the form of the *leaves* of *U. americana*, which, in the original Linnæan specimen, have wide rounded sinuses between the lobes. Their under surface is very soft, and finely downy; the upper more harsh. *Flowers* small, mostly aggregate. *Fruit* muricated, with short rigid prickles, rather large and broad. Very distinct from *U. sinuata*, hereafter described.

5. U. *ribesia.* Currant-leaved Urena. (Malva vel Alcea fruticosa, ribesii foliis, seminibus asperis; Sloane Jam. v. 1. 37. t. 11. f. 2.)—Leaves acutely three-lobed; rounded or heart-shaped at the base, with a solitary gland beneath. Segments of the outer calyx spatulate, bluntish.—Native of Surinam; *Herb. Linn.* of Barbadoes; *Sloane.* The *stem* is much more hairy or downy than in the last. *Footstalks* longer. *Leaves* roughish above, finely downy beneath, as in that species; but their lobes are acute, not dilated nor rounded, nor are the sinuses wide. The outer *calyx* has greener, more leafy and dilated, very deep segments. *Prickles* of the *fruit* much shorter than even the foregoing. Sloane's figure cannot be mistaken.

6. U. *repanda.* Wavy-leaved Urena.—Leaves wavy, serrated, scarcely lobed; reticulated beneath, with a solitary gland. Segments of the outer calyx awl-shaped. Fruit smooth.—Native of the East Indies; communicated by the late Dr. Roxburgh. The *stem* is downy, with many slender axillary branches, hardly so long as the leaves, on which the flowers are chiefly situated. *Leaves* broadly ovate, longer than their footstalks, serrated or sharply toothed, wavy, or slightly lobed; their upper side even, rough with starry hairs; under strongly reticulated with copious veins, paler, but scarcely more soft or downy. *Flowers* crimson, axillary, on short stalks, generally solitary. *Outer calyx* cloven but half way down, into five narrow acute segments; the tube becoming strongly ribbed after flowering, and containing the very small and unarmed *fruit.*

7. U. *sinuata.* Cut-leaved Urena. Linn. Sp. Pl. 974. Willd. n. 5. Ait. n. 2. Cavan. Diff. 336. t. 185. f. 2. ("Uren; Rheede Hort. Malab. v. 10. 3. t. 2." Alcea indica frutescens, foliis ad marginem exasperatis, bryoniæ albæ divisuris; Pluk. Phyt. t. 5. f. 3.)—Leaves five-lobed, with broad, deep, rounded sinuses; lobes three-cleft: pale and hairy beneath, with three glands at the base.—Native of the East and West Indies. This is known at first sight by the peculiarly wide rounded sinuses of the *leaves*, which are generally closed, by the sides of the lobes touching or overlapping each other; the middle lobe, and sometimes the two adjoining ones, have three broad, shallow, dilated and angular lobes: both sides are clothed with simple or divided, not much stellated, hairs, and the under one, though pale, is not hoary: its three principal ribs each bear a tumid open gland at the base beneath. *Flowers* small, axillary, stalked, solitary or in pairs. Segments of the *outer calyx*, according to Cavanilles, narrow and awl-shaped.

8. U. *heterophylla.* Various-leaved Urena. (U. sinuata; Swartz Obf. 263? Malvinda foliis inferioribus multifidis, superioribus incisis, flore solitario; Burm. Zeyl. 150. t. 69. f. 2. Alcea indica frutescens, foliis in lacinias variè diffectis; Pluk. Phyt. t. 74. f. 1.)—Leaves deeply five-lobed, with wide sinuses; middle segment deeply three-lobed: upper leaves elongated and contracted at the base: all hoary and downy beneath, with a solitary gland.—Native of the East, and perhaps West, Indies. To this species, which appears to us very distinct from the last, belongs the remark under *U. sinuata*, in Linn. Syst. Veg. of there being "one glandular pore on the mid-rib beneath;" which remark is copied by Willdenow, though it directly contradicts his own observation in the next paragraph. If the number of glands be invariably three in *U. sinuata*, this is certainly distinguished by its solitary gland on the mid-rib; but besides that character, the *leaves* are very differently shaped; their sinuses less rounded, and their under side more white and downy; to say nothing of the singularly contracted upper leaves. The segments of the *outer calyx* are lanceolate. *Corolla* purple. Prickles of the *fruit* elongated, doubly or triply barbed.

9. U. *multifida.* Jagged-leaved Urena. Cavan. Diff. 336. t. 184. f. 2. (Lappago laciniata; Rumph. Amboin. v. 6. 59. t. 25. f. 2? *Cavanilles.*)—Leaves hairy, deeply and acutely five-lobed, jagged, with a solitary gland beneath. Stem much branched. Flowers somewhat racemose.—Native of the island of Mauritius. The whole plant is clothed with shaggy down, apparently simple. *Leaves* heart-shaped, longer than their stalks, their five lobes deeply cut or pinnatifid, acutely and unequally serrated. *Flowers* yellow, on the smaller or ultimate branches, on short stalks; the lower ones axillary, the upper almost leafless. The *leaves* are represented by Rumphius with far slighter lobes than in the figure of Cavanilles, and yet his synonym, cited by Reichard and Willdenow for *lobata*, and marked *sinuata* by Linnæus, agrees better with the present species. It may, however, belong to some species not yet known to systematic botanists. See our n. 11.

10. U. *procumbens.* Procumbent Urena. Linn. Sp. Pl. 975. Willd. n. 7. Cavan. Diff. 337.—"Leaves hastate, somewhat heart-shaped, undivided, serrated. Stem procumbent."—Gathered by Osbeck, on little hills in China. The *stem* is shrubby, creeping, much branched. *Leaves* the size of *Origanum*, not lobed, smooth, sharply serrated. The *flowers* are larger than the leaves. *Linnæus.*

His

His herbarium contains no ſpecimen anſwering to this deſcription, nor have we ever ſeen any.

11. U. *Lappago.* Bur Urena. (U. procumbens; Linn. Syſt. Nat. ed. 12. v. 2. 462. Lappago laciniata; Rumph. Amboin. v. 6. 59. t. 25. f. 2?)—Leaves ſinuated, ſerrated, ſomewhat heart-ſhaped: hoary and downy, with a ſolitary gland beneath. Outer calyx in five deep lanceolate ſegments. Prickles of the fruit elongated, cylindrical, many-barbed.—Native of the Eaſt Indies. The *branches* are round, ſubdivided, ſlightly downy. *Leaves* on ſhortiſh ſtalks, acutely lobed, clothed with ſtarry down on both ſides, but moſt hoary beneath; their length about an inch and a half. *Fruit* large and tumid, muricated with prickles half a quarter of an inch long, each tipped with ſeveral pale hooks. We ſhould have little doubt of Rumphius's ſynonym, had there not been ſo many different opinions concerning it. Our deſcription is taken from ſpecimens to which Linnæus, long after he publiſhed his Sp. Plantarum, attached the name of *procumbens*, fabricating from them a new ſpecific character, which ſtands in the ſecond volume of his Syſt. Nat., and is adopted by Willdenow; but which is altogether irreconcileable to the deſcription of the original *procumbens*.

12. U. *viminea.* Rhomb-leaved Urena. Cavan. Diff. 335. t. 84. f. 1. Willd. n. 8.—Leaves acute, ſerrated, ſlightly lobed; rounded at the baſe, with a ſolitary gland beneath: upper ones rhomboid or oblong. Outer calyx in five deep lanceolate ſegments.—Gathered by Commerſon in Braſil. This ſeems next akin to the laſt, but the *leaves* are not ſinuated, nor of ſo uniform an oblong figure; they are hoary beneath. Of the *fruit* we have no account.

U. Typhalæa, Linn. Mant. 258, and *U. leptocarpa*, Suppl. 308, are referred by Cavanilles and Willdenow to PAVONIA; ſee that article.

URENA, in *Gardening*, compriſes plants of the woody perennial exotic kind, among which the ſpecies cultivated are, the angular-leaved urena (U. lobata); and the cut-leaved urena (U. ſinuata).

Method of Culture.—Theſe plants may be increaſed by ſeeds, which ſhould be ſown on a hot-bed, or in pots plunged into it, in the early ſpring ſeaſon. When the plants have ſome growth, they ſhould be removed into ſeparate pots, being replunged in a freſh hot-bed, requiring afterwards the ſame management as tender exotic plants. When placed in the ſtove in the ſpring, they ripen ſeeds the firſt year, but otherwiſe in the ſecond, and ſeldom continue longer.

They afford variety among other ſtove plants, by their flowers, and the manner of their growth, ſome riſing high, the others more procumbent.

URENTIA, are ſometimes uſed for medicines of a hot or burning quality. See CAUSTIC.

VRESEN, in *Geography*, a ſmall Daniſh iſland in the Great Belt; 4 miles N. of Langeland.

URETER, in *Anatomy*, the tube which conveys the urine from the kidney to the urinary bladder. See KIDNEY.

URETHRA, the canal by which the urine paſſes out of the urinary bladder; and through which the ſeminal fluid of the male is conveyed into the vagina of the female. See GENERATION.

URETHRA, *Strictures of.* A ſtricture of the urethra may be defined to be a preternatural diminution of the diameter of a part of that canal. By the late Mr. Hunter, ſtrictures of the urethra were divided into three kinds: firſt, the true permanent ſtricture, ariſing from an alteration in the ſtructure of the paſſage; ſecondly, a mixed caſe, compoſed of a permanent ſtricture and ſpaſm; and thirdly, the true ſpaſmodic ſtricture. (See Treatiſe on the Ven. Diſeaſe, p. 111.) This mode of dividing theſe caſes ſuppoſes the urethra to poſſeſs a natural power of contraction and relaxation; a circumſtance which, though moſt probably true, and moſt commonly believed, is not univerſally admitted. The doctrine of Mr. Hunter, however, has been ably ſupported by the obſervations of his brother-in-law, ſir Everard Home; and it has always appeared to us, that the facts in favour of the contractile power of the membrane of the urethra are equally obvious and convincing. It may be difficult, and perhaps impoſſible, ſays the latter author, to prove this membrane to be muſcular, either from its appearance, or from examination of its texture; ſince the peculiar ſtructure, upon which the contraction of a muſcle depends, has not as yet been aſcertained. Other ſtructures apparently membranous, and equally unlike the faſciculated fibrous texture commonly met with in muſcles, are endowed with a power of contracting and relaxing, in a much greater degree, than is ever found to take place in the membrane of the urethra. The tænia hydatigenia ovalis, an animal conſiſting of a ſemitranſparent membranous bag, met with in the brain, liver, and omentum of ſheep, when taken from its natural ſituation, and kept in tepid water, contracts and relaxes the different parts of its bag to a conſiderable extent. (See Pract. Obſ. on the Treatment of Strictures, &c. p. 15.) The muſcular ſtructure of the ureters cannot be demonſtrated, yet no one doubts that they poſſeſs a contractile power. As is obſerved in the article KIDNEY, of this Cyclopædia, their function of conveying the ſecreted urine from the kidney to the bladder requires the exerciſe of tonic powers; and the idea of this fluid finding its way by the force of gravity, is not only repugnant to the laws of the animal economy, but is irreconcileable with obvious phenomena. The adheſion of the ſides of the tube, where it penetrates the coats of the bladder, preſents an obſtacle, which can be overcome only by the exertion of ſome force; and this obſtacle is vaſtly increaſed in the diſtended ſtate of the bladder, during which the fluid is conſtantly finding its way into this receptacle.

In the ſame manner, although the muſcular ſtructure of the urethra cannot be demonſtrated, yet many phenomena are in favour of the affirmative, and, at all events, leave no doubt of the canal poſſeſſing a power of altering its diameter. Here the functions of the part, and certain facts remarked in practice, afford a better criterion than anatomy, which, it is allowed, does not in this inſtance give us any kind of evidence. When the urine paſſes out, the canal is large; when the ſemen is thrown out, it is ſmall. When a portion of its membrane is in an inflamed ſtate from gonorrhœa, its ſurface is more readily ſtimulated, and the irritation of the urine makes it contract ſo much, that frequently the fluid is voided only by drops. In this ſtate, if the penis be immerſed in warm water, the urethra often becomes ſuddenly relaxed again, and the urine is more eaſily diſcharged. In many caſes, the ſurgeon finds, when he attempts to introduce ſtimulating injections into the urethra, that they will not paſs on towards the bladder, but bring on ſo ſtrong a contraction of the paſſage, that they are rejected again with conſiderable velocity.

The celebrated Soemmerring has explained the formation of ſtrictures by a thickening of the diſeaſed part, and he does not appear to entertain any belief in the ſpaſmodic nature of theſe caſes. (See Abhandlung über die Schnell und Langſam tödtlichen Krankheiten der Harnblaſe, und Harnröhre bey Männern im hohen alter. Frankf. 1809.) Mr. Charles Bell alſo contends, that the white condenſed ſubſtance, which conſtitutes the moſt common kind of ſtricture, muſt be equally incapable of yielding to preſſure and ſpaſmodic action.

action. He observes, that this fact of the firm nature of a stricture, pointed out by Mr. Hunter, is a sufficient proof to himself, that a stricture cannot be spasmodic; and that even if the diseased part of the urethra were originally muscular and contractile, the condensation and callosity of the part must be attended with loss of the contractile power.

Mr. C. Bell argues, that it is from confounding the effect of the proper muscles of the urethra, the canal has been imagined to possess a muscular property. "I made," says he, "the following simple experiment, in order to put this to the test. I got a small ivory ball, to which I attached a thread. I introduced the ball into the urethra. I made the man endeavour all he could to push it out, but he could not; neither was it retained in the slightest degree, when pulled by the thread. I thought it might be more satisfactory, if I imbued the ball with something stimulating. I tried coarse soap and spirits; but still there was no power in the urethra to retain the ball, or to push it forth. This could be done only by the urine behind it, and the operation of the bladder, or the ejaculator seminis. I need not add, that this experiment was made upon a part of the urethra anterior to the seat of the ejaculator seminis. In the course of practice I find, that, when the silver ball is introduced down to the ejaculator seminis, it is resisted by that muscle, especially when the parts are irritable. I find it sometimes thrown out of the grasp of the muscle; but when pushed fairly into the sinus of the urethra, which is into the middle of the muscle, the ball is allowed to remain." (Letters concerning Diseases of the Urethra, p. 95, Lond. 1810.) The same gentleman also endeavoured to ascertain whether the urethra had any action on fluids. He employed a glass tube to throw an injection into the urethra, the end of the tube being constructed for passing into the orifice of the passage. Pressure was made on the urethra five inches down. By elevating the tube or column, the fluid distended the urethra; but no irregularity in the height of the fluid in the tube indicated any muscular power of the urethra to discharge its contents. When the urethra was distended, the slightest touch upon it with the finger elevated the fluid in the tube; but no effort of the patient produced the effect. When he made the effort, it was with the ejaculator seminis behind the part of the urethra compressed by the fingers. (P. 96.) The conclusion drawn by Mr. Bell from these facts is, that the part of the canal, anterior to the muscles which surround it, has no muscular power.

Mr. Bell thinks, that we can be at no loss to account for spasm in the posterior part of the urethra, since five inches of the canal in that situation are surrounded by muscles; the accelerator urinæ or ejaculator seminis, the sphincter vesicæ, the compressor prostatæ, and the levator ani. And he adds, that it must never be forgotten, that it is the sensibility of the urethra which governs their contraction.

Although we conceive, that the muscles in the perineum have in some degree the effect which the foregoing writer imputes to them, he is far from having convinced us that the membrane of the urethra is not endued with muscular power. In the first place, the two experiments, above related, are by no means so decisive as the author fancies them. The first with the ivory ball proves nothing; except that this body was not expelled at once by the muscular power of the canal. But it is conceivable, that such power might exist, and yet operate rather so as to grasp and retain the foreign body, than force it out. Nor is it explained how much time was allotted to the experiment; a point essential to be known: because it is not to be supposed that the ivory ball would be instantly forced out again. The experiment of the injection is also nugatory; because as a stimulating fluid was not used, (perhaps only water,) it is not likely that any particular contractile action of the urethra would be thus excited. In opposition to Mr. Bell's opinions, therefore, we continue to believe that the membrane of the urethra possesses a contractile power. We think in this manner also, because there are certain phenomena, which cannot be explained by the contraction of any of the muscles with which the urethra is embraced. Thus, for instance, a bougie may frequently be easily introduced as far as a stricture; the patient suffers little uneasiness, and no resistance is experienced; but no sooner is the passage irritated by the pressure of the bougie against the obstruction, than it contracts and grasps the instrument with manifest force. Much resistance is now felt on withdrawing the bougie; and it is in a great measure continued, till the instrument is quite out of the urethra. There are few surgeons of any experience who have not observed this fact. Did the resistance depend upon a spasm of the muscles in the perineum, it could only last while the bougie was in the contiguous part of the urethra. We find, however, that even the last inch of the bougie is evidently grasped. The experiments of Haller are also at variance with the conclusions above related; for he distinctly mentions, that chemical stimulants will make the urethra contract. Indeed, as a late writer observes, the muscular power of this canal may be proved almost in any instance, by introducing a bougie of moderate size into the healthy urethra, and lightly supporting the end that projects from the penis in a horizontal position. If the action of the urethra is then watched with attention, it will be found, that the power which expels the instrument, in other words, the contraction of the urethra, is uniform through its whole extent. The point of the bougie is not pushed forward more quickly while it moves through the bulb of the urethra, where the canal is surrounded with strong muscles, than it is afterwards; but, on the contrary, its motion is exceedingly slow, and perfectly equal throughout, until the whole of the instrument is expelled, and the point fairly drops from the orifice of the urethra. (Howship's Pract. Obs. on Diseases of the Urinary Organs, p. 180.) These considerations are also favoured by analogy, since comparative anatomy demonstrably proves, that in the larger animals, particularly the horse, whose structure is more easy of investigation, and the functions of the urethra precisely the same as in man, the strong muscular fibres, encircling the urethra, cannot be overlooked. Op. Cit. p. 182.

On the whole, however, it does not appear to us, that the question is of great importance in a practical point of view; since the treatment of strictures should in all probability be conducted on precisely the same principles, whether the spasm, that sometimes has a share in increasing the impediment to the exit of the urine, depend upon the muscularity of the membrane of the urethra itself, or upon the muscles situated near the canal, especially as their action is said by Mr. Bell himself to be entirely governed by the sensibility of the passage. We think also, that the term spasmodic stricture might as well be dropped, and that no case ought to be called a stricture, until there is some permanent contraction, arising from a change of structure, in the diseased part of the urethra. Nor does it appear to us, that any material light is thrown upon the mode in which the disease is formed, by imputing so much to spasm as several writers have done.

According to Mr. Hunter, the disease generally occupies no great length of the passage; and in most of the cases which he had seen, it extended no further in breadth, than if the part had been surrounded with a piece of packthread.

Indeed, in many of the examples, the ſtricture is ſaid to have preſented a great deal of that appearance. Mr. Hunter adds, however, that he had ſeen the urethra contracted for more than an inch in length, owing to its coats, or internal membrane, being irregularly thickened, and forming a winding canal. (P. 113.) Sometimes, alſo, as ſir E. Home obſerves, two ſtrictures form within an inch of each other, and the ſpace between them becomes narrower than the reſt of the canal.

A ſtricture, ſays Mr. Hunter, does not ariſe, in all caſes, from an equal contraction of the urethra all round; but, in ſome, from a contraction of one ſide. And ſir E. Home informs us, that he has met with caſes where there were three ſtrictures, and all on the ſame ſide of the urethra; the other being perfectly ſmooth. This form of the diſeaſe throws the paſſage to the oppoſite ſide, and often renders the introduction of the bougie difficult. Mr. Hunter alſo acquaints us, that the contracted part is whiter and harder than any other part of the urethra. Sometimes there are more ſtrictures than one; and this eminent ſurgeon had ſeen half a dozen in one urethra, ſome of which were more contracted than others. Indeed, ſays he, many urethras, that have a ſtricture, have ſmall tightneſſes in other parts of them.

The urethra naturally is not of the ſame diameter throughout its whole extent; and ſome parts of it are found to be much more liable to ſtricture than others. In order to determine with preciſion the length, as well as width of the urethra, ſir E. Home took exact caſts of it in wax. The ſubjects from which they were taken were of different ages: one was between 70 and 80; the other, 30. The length of the canal correſponded exactly in both caſts. From the external orifice to the neck of the bladder was 9 inches; but, in a note, this gentleman obſerves, that, in a relaxed ſtate, the canal is commonly about 8¼ inches in length. From the external orifice to the bulb of the urethra was 7 inches. The membranous part, extending from the bulb to the proſtate gland, 1½ inch; and the canal paſſing over the proſtate gland was half an inch in length.

The following were the diameters of the caſts of the urethra in different parts.

	Years old. 80	30
At three-quarters of an inch from the external orifice - - - - - - - -	$\frac{9}{20}$	$\frac{7}{20}$ ½
At 4½ inches from the external orifice -	$\frac{7}{20}$	$\frac{7}{20}$
At the bulb, 7 inches from the orifice -	$\frac{13}{20}$	$\frac{13}{20}$
In the membranous part directly beyond the bulb, 7½ inches from the orifice - -	$\frac{7}{20}$	$\frac{6}{20}$
In the membranous portion near to the proſtate gland, 8¼ inches from the orifice - -	$\frac{9}{20}$	$\frac{7}{20}$
Where the membranous part terminates, and the proſtate gland begins, 8½ inches from the orifice - - - - - - -	$\frac{11}{20}$	$\frac{10}{20}$
At the neck of the bladder, 9 inches from the orifice - - - - - - - -	[illegible]	[illegible]

Theſe dimenſions, it is to be underſtood, are much beyond thoſe of the eaſy ſtate of the urethra.

The two parts of the urethra, which are naturally the moſt narrow, are found alſo to be thoſe moſt liable to ſtricture. In fact, ſtrictures occur moſt commonly juſt behind the bulb of the urethra, the diſtance from the external orifice being 6½ or 7 inches. The ſituation, next in order of frequency, is about 4½ inches from the orifice of the glans. Strictures do alſo form at 3½ inches from this orifice, and ſometimes almoſt cloſe to it. Mr. Hunter never met with a ſtricture in that part of the urethra which paſſes through the proſtate gland. P. 114.

In ſome caſes, as ſir E. Home further remarks, the external orifice itſelf is contracted. When this happens, it is ſometimes the ſource of conſiderable errors, the ſurgeon ſuppoſing the whole canal to be naturally formed of the ſame ſize.

The prepuce alſo is very often contracted, which is called a natural phymoſis. Sir E. Home believes, that this more frequently happens in thoſe who are diſpoſed to ſtrictures than other men.

In almoſt all the caſes which have come under this gentleman's care, there has been one ſtricture about ſeven inches from the external orifice, whether there have been others or not. Such part of the canal ſeems much more diſpoſed to contract than the reſt of it.

It is noticed by Mr. Hunter, that moſt of the obſtructions to the paſſage of the urine, if not all, are attended with nearly the ſame ſymptoms, ſo that there are hardly ſufficient marks for diſtinguiſhing the different cauſes. Few patients take notice of the firſt ſymptoms of a ſtricture, till they have either become violent, or have been the cauſe of other inconveniences. For inſtance, a patient ſhall have a conſiderable ſtricture, without obſerving that he does not make water freely; he ſhall even have a tendency to inflammation and ſuppuration in the perineum, and not feel any obſtruction to the paſſage of his urine, nor ſuſpect that he has any other complaint than the inflammation in the perineum. In all theſe obſtructions, the ſtream of water becomes ſmall, and that in proportion to the obſtruction; but this ſymptom, though probably it is the firſt, is not always obſerved by the patient. In ſome the urine is voided only in drops, and then the diſorder cannot eſcape notice; in others the ſtream is forked or ſcattered. (Hunter, p. 112.) Although, as ſir E. Home obſerves, the firſt progreſs of the contraction is generally very ſlow, yet, when once it has ſo far increaſed, that the urethra is not wholly relaxed by the force of the urine, its ſubſequent advances are more rapid, and new ſymptoms are perceived. The urine is voided more frequently; does not paſs without a conſiderable effort, attended with pain, and a ſtraining continues after the bladder is emptied. If the patient accidentally catches cold, drinks a glaſs of ſpirituous liquor, acid beverage, or punch, commits an exceſs in drinking wine, or removes quickly from a warm to a cold climate, the urine will paſs only in drops, or be entirely obſtructed; theſe cauſes, inducing in the contracted part a ſpaſmodic action, by which it is cloſed. Cold, externally applied to the body (continues ſir E. Home), has ſo great an effect upon a ſpaſmodic ſtricture, that a patient who can make water without the ſmalleſt difficulty in a warm room, upon attempting it in the open air ſhall be entirely unable to void a drop; but, even in this difficulty, if he returns to a warm room, and ſits down ſome little time, the urine will come away. The experience of the ſame gentleman tends to prove, that the ſymptoms of ſtricture come on more frequently while the patient is leading a ſedentary than an active life.

Permanent ſtrictures are generally attended with a diſcharge of matter, or a gleet. This is often conſidered by the patient as the whole diſeaſe; and ſometimes it is not till after the ſurgeon has long in vain tried every means that he can imagine to effect a cure, that other ſymptoms are noticed, and a ſtricture at laſt ſuſpected. In diſeaſes of the urethra, and alſo in thoſe of the proſtate gland and bladder, there is uſually an uneaſineſs about the perineum, anus, and lower part of the abdomen; and, as Mr. Hunter remarks, the patient can hardly croſs his legs without pain.

Frequent intercourse with women generally renders strictures worse. Under these circumstances, says sir E. Home, the membrane of the urethra is kept longer in a state of contraction; and the part disposed to stricture loses the power of relaxing itself again. Although the passage is not completely closed, it is rendered much narrower, and remains in an extremely tender state. Hence, the passage of the urine irritates it, and in a few hours a discharge of matter comes on similar to that from gonorrhœa. In certain instances, the contraction is so great, that it stops the emission of the semen altogether, and forces it back into the bladder; while in some other cases this fluid passes through the stricture after the orgasm has taken place, but with little or no force.

There is one circumstance which has a great tendency to make a stricture be mistaken for a gonorrhœa; *viz.* the pain in making water is confined to the same spot in both diseases. A stricture in the membranous part of the urethra does not render the part itself particularly sensible; but all the painful sensations are felt about an inch and a half from the orifice of the glans penis. This is a general fact, and unaccountable as it may seem, it is not more extraordinary than the burning pain felt in the glans, in cases of stone, even when the whole of the urethra is perfectly sound.

When a stricture is in an advanced stage, the diseased part is at all times much narrower than the rest of the canal. The stricture, however, according to sir E. Home, still retains a power of contracting and relaxing itself; in the contracted state, closing up the passage; in the relaxed state, allowing the urine to pass through it in a small stream. In this state the stream is so small, and the exertion necessary to empty the bladder so great, that the patient can seldom be wholly ignorant of his complaint.

The spasmodic contraction, upon any irritation being applied to the part, is, as sir E. Home describes, very great. This is known by the urine being unable to pass in a stream; and by the extreme difficulty of now passing a small bougie, which, in the relaxed state of the canal, met with no resistance. The bougie also, if allowed to remain a few minutes, is not unfrequently grasped so tight by the spasmodic contraction, that it cannot be withdrawn without considerable force. The bougie, when examined (continues sir E. Home), puts on an appearance exactly resembling what would have been produced, if a piece of packthread had been tied round it. In this stage, the spasmodic contractions, although more violent, occur less frequently than while the stricture was in a more recent state. When the stricture has been of some years standing, the coats of the bladder become thickened, in order to increase the power of this organ to expel the urine, the evacuation of which is rendered difficult by the obstruction. The bladder, in this thickened state, does not admit of the usual dilatation, so that the patient is obliged to make water every three or four hours, or oftener. See Home's Pract. Obs. on Strictures.

In addition to the foregoing symptoms, we have further to enumerate, amongst the numerous effects of strictures in the urethra, nocturnal emissions; and, in irritable patients, a variety of unusual sensations about the membranous part of the urethra, conveying to the mind the idea of something crawling or fluttering. In many cases also, there is a periodical discharge, brought on by cold, or other occasional causes. When this happens, the inflammation extends to the bladder; the frequency of making water is very much increased; and the urine very turbid. Sometimes the bladder inflames more violently, and secretes purulent matter, which passes out after the urine. In still worse attacks, the discharge from this viscus is glairy, like the white of an egg, and of a strongly tenacious consistence. The discharge of pus and gelatinous mucus with the urine, has been regarded as particularly evincing an ulcer, or calculus in the bladder; but it is a symptom which arises from any irritation of that organ, and is frequent in cases of old strictures.

Attacks of the preceding kind may bring on peritonitis, and the patient is carried off. Sometimes also the incessant irritation of the strictured part, by the efforts to make water, brings on a gradual diminution of the canal, and, in a few instances, a total obliteration of a portion of it. This last event cannot happen without destroying the patient, unless another outlet be formed for the urine. Complete strictures, therefore, as sir E. Home remarks, are only met with where fistulæ in perinæo have been produced.

Some patients with strictures seem extremely liable to complete paroxysms of fever; that is to say, they often have a cold, hot, and sweating stage of febrile disorder in regular succession. The sweating is also remarked to be much more profuse than in a common ague.

Strictures in the urethra likewise occasion a swelling of the testicle. When permanent and considerable, they are also apt, under particular circumstances, to cause strangury and retention of urine. If a patient goes suddenly from a warm into a cold situation; if he drinks too freely of wine; eats high-seasoned dishes; catches cold; commits any species of intemperance; or delays making water too long, after feeling the inclination, he exposes himself to the danger of these latter grievances.

The causes of strictures in the urethra are not known with any degree of certainty. The origin of the disease is often imputed to the effects of gonorrhœa, or to the method of curing it. Mr. Hunter, however, conceives that there are many reasons why this doctrine is not likely to be correct. Strictures, he observes, are common to most passages in the human body; they often occur in the œsophagus; in the intestines, especially the rectum; in the anus; in the prepuce producing phymosis; and in the lachrymal duct, without any previous disease. They sometimes happen in the urethra itself, without ever having been preceded by any venereal complaint. Mr. Hunter saw an instance of this kind in a young man of nineteen, who had had a stricture for eight years, and which therefore must have begun when he was only eleven years of age. The case was treated at first as the stone or gravel. The patient was of a weak scrophulous habit, and the stricture in the most usual place, about the membranous part of the urethra. Mr. Hunter had also seen a stricture in a boy only four years of age, and a fistula in the perineum in consequence of it. He reminds us also, that strictures are as common in persons who have had gonorrhœa slightly, as in those who have had it violently. They are also never found to come on during the inflammation which attends a clap, nor for some time after the infection is gone. Thirty and forty years sometimes elapse between the cure of a gonorrhœa and the beginning of a stricture, the health being all that time perfectly good. If strictures arose in consequence of the inflammation accompanying this disorder, we should expect to find them of some extent, because the inflammation is itself of some extent; and we should also expect to find them most frequent in that part of the urethra which is usually the seat of gonorrhœa. But the fact is, they are not so frequent there as they are in other parts of the urethra. Sir E. Home, however, differs from Mr. Hunter on this point, in thinking, with most other surgeons, that gonorrhœa is a very general cause of strictures.

It is supposed by many, says Mr. Hunter, that strictures arise from the use of injections in the cure of gonorrhœa; but

but he thought the opinion founded on prejudice; for he had feen as many ftrictures after gonorrhœas, which had been cured without injections, as after other cafes, which had been cured with them. Such modes of accounting for ftrictures, he obferves, give no explanation of cafes which have not been preceded by gonorrhœa, or the ufe of injections. Sir E. Home alfo thinks differently from Mr. Hunter refpecting injections, the injudicious ufe of which he conceives may often caufe ftrictures. Strictures have fometimes been fuppofed to arife from the healing of ulcers in the urethra; but Mr. Hunter fays, he never faw a fore in this paffage, except in confequence of a ftricture, and he therefore does not fubfcribe to the opinion.

The ftone is fometimes a caufe of ftricture, and this occafionally happens in infancy. Sir E. Home has met with cafes of this kind in children only fix years of age; and, from other examples which he has recorded, it would appear, that the difeafe is frequent in calculous patients of more advanced years.

In the Eaft Indies, and other warm climates, ftrictures are much more readily brought on than in Europe; and it is thought, that the exceffes, in which the inhabitants of hot countries indulge, have great effect in promoting the formation of the diforder.

Strictures have been known to arife from the application of external violence to the perineum; from the irritation of blifters affecting the membrane of the urethra; and from the irritation of a difeafed proftate gland. Cafes, in proof of thefe obfervations, may be perufed in fir E. Home's publication.

In the treatment of this difeafe, the firft thing is to afcertain the precife fituation of the ftricture neareft the orifice of the urethra. For this purpofe, a common bougie, proportioned to the fize of the orifice of this canal, is to be gently introduced. If the bougie eafily enters the paffage, the furgeon may be well affured, that, if there be no obftruction, the fize of the inftrument cannot be too large for the reft of the canal, the orifice of which is naturally lefs capacious than moft other parts of it. Small bougies, and fuch as are too much pointed, however, are frequently ftopped by the lacunæ, or orifices of the mucous glands, and lead inexperienced furgeons into error.

In introducing any inftrument properly into the urethra, fome degree of fkill is difplayed. When a bougie or catheter is to be paffed, the furgeon fhould take hold of the penis, by placing the fore-finger and thumb of his left hand on each fide of the prepuce, oppofite the corona glandis: thus he avoids making any preffure on the paffage into which he is about to pafs the bougie. This being oiled is to be introduced at firft a little way; then the furgeon is to draw the penis forward, as it were over it, with the fore-finger and thumb of his left hand, while, at the fame time, he gently and fteadily perfifts in pufhing the inftrument further into the paffage with his right hand. The bougie itfelf is to be held like a writing pen, and, as it enters the urethra, it ought to be artfully rotated, firft in one direction, then in the other, in order that its extremity may more certainly efcape being entangled in any natural fold of the membrane lining the paffage.

Having afcertained, by the introduction of a bougie, the exiftence and fituation of the ftricture neareft the mouth of the urethra, the next defideratum is to learn, whether the contraction is fuch as would be produced by tying a piece of packthread round the canal; whether, on the other hand, it occupies a confiderable extent of the paffage; and, laftly, what is the fize of the bougie which can be introduced through it. A knowledge of the extent of the ftricture is a circumftance that would always be of effential ufe to the practitioner, if it could be obtained; becaufe, we prefume, no furgeon, knowing that the obftruction and difeafe extend far along the urethra, would ever in fuch a cafe give a preference to the employment of armed bougies. Thofe armed with the nitrate of filver could never be expected to burn their way through a ftricture an inch in length; and if other bougies, armed with the cauftic potaffa, are conceived to admit of being applied to fuch a ftricture with any degree of precifion, or any other real efficacy than what actually arifes from the mechanical action of thefe inftruments themfelves, when paffed through the ftricture, we confefs that it is more than our obfervations authorize us to believe. We have no hefitation in giving it as our opinion, that, in all cafes of this defcription, as well as in others, in which two ftrictures are near together, and the intervening part of the canal much contracted, cauftic bougies ought not to be ufed.

Having afcertained that a common-fized bougie will not pafs beyond a particular point of the urethra, we ought to make an impreffion on the inftrument with the finger-nail, clofe to the mouth of the urethra. Then the bougie fhould be withdrawn, and the furgeon fhould take one of a fmaller fize, which he is to mark with his nail, exactly at the place correfponding to that of the impreffion on the firft bougie. This fmaller one is to be introduced fufficiently far to bring its marked part exactly to the orifice of the urethra, at which period the furgeon knows that the extremity of the bougie has juft arrived at the contraction, which would not allow the firft common-fized bougie to pafs. If the fecond bougie cannot be introduced farther than the firft, a ftill fmaller one is to be tried; but the furgeon fhould not have recourfe to the fmalleft bougies at once, as the largeft bougie which can be got through the ftricture ought to be the model of the foft white one, which fhould now be introduced for the purpofe of fhewing the fhape and extent of the ftricture by the impreffions made upon it. If, after the foft bougie has remained a minute or two in the ftricture, it fhould be marked with a diftinct circular or femi-circular narrow furrow, on being withdrawn, we have reafon to believe, that the ftricture does not occupy much of the extent of the urethra. On the contrary, when the impreffions and irregularities on the foft bougie are extenfive, it is to be fufpected that the ftricture is not confined to a limited point of the canal. At the fame time it muft be acknowledged, that it is fomewhat difficult to form a certain judgment from the appearances of the bougie, becaufe thefe will depend very much upon the force or gentlenefs with which the inftrument is ufed. In particular, it is extremely difficult to learn pofitively whether the urethra is diminifhed in diameter immediately behind the moft contracted part of the ftricture. Mr. C. Bell propofed the employment of a particular fort of probe for determining the extent of ftrictures. "I procured (fays this gentleman) a feries of filver and gold probes, with circular knobs; the knobs varying from the full fize of the urethra to what will juft pafs the narroweft ftricture. By fucceffively introducing fmaller balls, I afcertain the degree of ftricture by the ball which paffes eafily; and I am fecure of being in the paffage by paffing the probe onward, when it has got beyond the ftricture. Then by the flight feeling of refiftance in paffing the ball, and in withdrawing it again through the obftruction, I afcertain the extent of the contraction. If the ball of this probe be liable, like the point of the bougie, to enter one of the lacunæ, or, on paffing it, to rub upon its edge, yet, by feeling whether the fame roughnefs or difficulty attends the withdrawing of the bulb of the probe as when it paffed downward, we may be affured whether there be a ftricture of the canal, or whether the

the obstruction be not caused merely by the lacunæ." Oper. Surgery, vol. i. p. 104.

This author further observes, that as the lacuna opens in a direction towards the orifice of the urethra, its edge cannot catch the probe when this is withdrawn, at which period a uniform smoothness must be felt, unless there be disease. When there is an irregular hardening of the urethra for a considerable extent, the probe is said to move along it with difficulty; but no sooner has it passed the obstruction, than it moves on with freedom. Likely as these ball-probes for the urethra at first seem to be to afford desirable information respecting the species of stricture, they are at present not much used by surgical practitioners. In fact, in practice they do not answer; and it is the contractile power of the urethra, or (if others will not allow it) it is the action of the muscles contiguous to this passage, which sometimes stops the easy introduction of the probe even when there is no permanent stricture whatever, and which makes it more difficult to ascertain the nature and extent of the obstruction than would otherwise be the case.

That great utility in practice would be derived from being able to learn the nature of the stricture, must be as obvious as the fact, that a caustic bougie is not at all calculated to remove the obstruction when it is of any extent. Such an instrument (we mean particularly a lunar caustic one) could only act on the anterior part of the contraction, without presenting any prospect of being sufficiently efficacious to burn its way, by repeated applications, through the whole extent of the stricture. Even could we imagine that it had this power, our judgment and common sense would revolt at the doctrine of this being the proper plan to be pursued. The common bougie, on the other hand, is introduced through the whole extent of the stricture, and acting like a wedge on every part of it, produces a general dilatation of the obstruction. When the stricture is attended with a conical lessening of the canal in front of it, a common bougie must also merit a preference.

Treatment with the common Bougie.—This instrument acts by producing a mechanical dilatation of the stricture. As it operates, however, on living matter, it either makes the dilated part adapt itself to its new position, or recede by ulceration. If the case is one that will allow even the smallest bougie to be introduced through the stricture, the cure may be considered to be within our power. In many cases in which the stricture is considerable, a great deal of trouble is given by occasional spasms, which either prevent the introduction of the bougies altogether, or only allow a very small one to pass. In such cases, Mr. Hunter was sometimes able to make the bougie pass, by rubbing the perineum with one hand, while he pushed forward the bougie with the other. He also frequently succeeded by letting the bougie remain close to the stricture a little while, and then pushing it forward. The spasm has sometimes been removed by dipping the penis in cold water.

It is sometimes difficult to know, whether a small bougie has passed through a stricture, or only bent. In this case, a common-sized bougie should be previously introduced to learn the situation of the stricture; and, afterwards, when the end of the small bougie is known to have reached the obstruction, the surgeon should push the instrument forward very gently, and for a short time. If the bougie enters the penis further, he may know whether it has entered the stricture by removing the pressure from the bougie; for, if this recoil, it has not passed, but only bent. After all, however, every practical surgeon knows, that it is sometimes incorrect to take even such a criterion, and a very small bougie frequently bends, and yet does not afterwards recoil in the least.

When the bougie has passed a little way through the stricture, and remained there a short time, we should withdraw it, and examine its extremity. If this should be flattened, grooved, or have its waxen coat pushed up for some extent; or, if there should be a circular impression on the bougie, or only a dent on one side made by the stricture, we may be sure that the instrument has passed as far as those appearances and impressions extend.

Now it becomes necessary to introduce another bougie of exactly the same size, and let it remain as long as the patient experiences no particular inconvenience.

When the end of the first bougie is blunted, we may be sure that it has not passed the stricture at all.

The best time for wearing bougies is when the patient is in bed in the morning, or when he has an opportunity of keeping himself perfectly quiet. The bougie should be gradually increased in size, as the stricture dilates, till the largest one can easily pass, and its use should be continued for three or four weeks afterwards, in order to habituate the parts to their new state.

It is well known that strictures are very liable to return, and hence the treatment with common bougies has been accused of inefficacy. We have known, however, some cases in which the cure lasted many years; and others in which the stricture returned, although caustic bougies had been employed. One reason why the disease often relapsed in former times was, because surgeons had no correct notions respecting the naturally capacious diameter of the urethra, and consequently they never increased the size of the bougie, as far as it ought to have been, in proportion as the disease gave way. In the employment of caustic bougies, on the other hand, surgeons have always preferred large ones; and, if these instruments ever render the cure more durable, we conceive that the success is in a great measure ascribable to this circumstance.

Common bougies have one advantage over those armed with lunar caustic; *viz.* that of being sometimes capable of acting upon several strictures at once, when they are introduced into the urethra; a thing which is impossible in the other method.

Treatment with Elastic Gum Catheters and Bougies.—Perhaps there is no plan of treating strictures in the urethra which is so mild and unirritating as that with instruments coated with elastic gum. It is the common method of treatment followed in France, where caustic bougies appear to be entirely abandoned. The celebrated Desault, who had considerable success in the treatment of strictures, rarely employed any means of cure except an elastic gum catheter. That this instrument can frequently be introduced through a stricture, even when nothing else will pass, seems well known to every practitioner in surgery; for, whether he is an advocate for one method of cure or another, he no sooner fails in his attempts to get through a stricture, than he tries what can be done with a gum catheter. It is quite unnecessary to dwell long on the mode of curing strictures with this instrument, or the elastic gum bougie. The cure is effected on the principle of dilatation; the very same principle on which the common bougie operates. The catheter will sometimes pass without the stilet, when it will not do so with it. This instrument, being much less irritating than a common bougie, can be longer worn without inconvenience, especially as the patient can also void his urine without taking it out. Indeed, it may be worn several days together, if judged advisable; but we believe it is generally better to withdraw it sooner, and endeavour to get in as quickly

quickly as possible other elastic gum catheters of larger size. The elastic gum bougie sometimes will not pass a stricture in the membranous part of the urethra, owing to the elasticity of the instrument tending to keep its point from ascending over the ridge in the canal. In some cases we have found them on this account not to answer, and have been obliged to use either a common bougie, or an elastic catheter containing a wire.

Treatment with Bougies armed with Nitrate of Silver.—The practice of applying caustic to strictures was known to Wiseman, who is justly esteemed the father of English surgery. The caustic which he used was the common red precipitate, and he introduced it into the urethra by means of a cannula. It appears that Mr. Hunter was not aware that any proposal of the kind had ever been made by others, when he first conceived the project of curing strictures in the urethra with caustic. It was only afterwards that he learned what Wiseman had done; and there can be no doubt, that if the idea had not existed previously, we should still have derived it from the fertile genius of Mr. Hunter. The instruments with which he employed caustic consisted of a silver cannula and a stilet. One end of the stilet had a small bulb, which filled up the end of the cannula, and made it pass more easily down to the stricture. The other end was a port crayon, containing the piece of caustic which was introduced through the cannula, and applied to the stricture. The application having been made, the port crayon was drawn back into the cannula, and the whole taken out of the urethra.

It is observed by sir Everard Home, that the foregoing method of using caustic was found in practice to be liable to a variety of objections. No silver cannula could be well adapted to the flexible canal of the urethra. Hence, when the caustic was applied, and any degree of pressure exerted, the effect of the caustic was necessarily produced upon the angle, between the stricture and side of the urethra, and not upon the middle of the stricture, the part intended to be destroyed. Mr. Hunter not only saw the inconveniences of the cannula, but he actually endeavoured to obviate them by devising a more simple and commodious method of applying caustic accurately to the centre of the stricture. The following is the improved mode, as explained by sir E. Home: Take a bougie of a size that can be readily passed down to the stricture, and insert a small piece of lunar caustic into the end of it, exposing the surface of the caustic, but surrounding it every where laterally with the substance of the bougie. This should be done some little time before it is used; for the materials of which the bougie is composed become warm and soft by being handled in the insertion of the caustic; and, therefore, the hold which the bougie has of the caustic is rendered more secure by the instrument being allowed to cool and become hardened.

This bougie is to be oiled, but before passing it, a common bougie of the same size is to be introduced down to the stricture, in order to clear the canal, and to measure exactly the distance of the stricture from the external orifice. This distance being marked upon the armed bougie, the latter is to be passed down to the stricture as soon as the common one is withdrawn. In its passage the caustic can scarcely come into contact with any part of the lining of the urethra, as the point of the bougie, of which the caustic forms the central part, always moves in the middle line of the canal; and indeed the quickness with which it is conveyed to the stricture must also prevent any injury of the membrane.

When the armed bougie is in contact with the stricture, it is to be steadily retained there, with a moderate degree of pressure at first, which is to be afterwards diminished, or else it would bend the bougie when this becomes softened by the warmth of the urethra. The time which it is to remain depends a good deal upon the sensations of the patient, and the length of time the parts have been diseased; but on the first trial it should be less than a minute, as it then commonly gives greater pain than at any subsequent application. Every other day is generally as often as the caustic bougie can be used with prudence. However, in obstinate cases, sir E. Home has sometimes employed it every day.

The bougie, which is introduced into the urethra previously to the armed one, should be made of soft materials, in order that it may mould itself to the form of the passage, and communicate some information relative to the extent, degree, and position of the stricture.

The pain arising from the application of the nitrate of silver, or lunar caustic, to strictures, is represented by sir E. Home as much more moderate than might *à priori* be apprehended. This gentleman has even related instances, in which the piece of caustic slipped out of the bougie, and remained in the urethra; yet without occasioning any very severe symptoms.

In the course of the use of caustic bougies, especially when the patient is guilty of any imprudence, it is possible for some uncommon symptoms to arise.

The first is a swelling in the perineum. It is very apt to be brought on when the surgeon is endeavouring to remove that part of the stricture which is nearest to the sides of the urethra. The swelling, which is of considerable size, is totally different from that which is produced by the irritation of the long continuance of bougies in the passage, and which ends in an abscess. It is entirely caused by blood extravasated in the cellular membrane, and which is readily absorbed. The inflammation is also slight, and soon subsides.

A second effect of caustic, in some particular cases, is a very profuse hemorrhage. According to sir E. Home, the bleeding never occurs with violence, except when the stricture has been completely destroyed. This gentleman has related several examples of such hemorrhage, and others are on record. See Edinb. Med. and Surg. Journ. vol. v. p. 333.

A third ill consequence, sometimes induced by the use of armed bougies, is strangury. According to sir E. Home, it is not common for caustic to produce this effect. On the contrary, he states, that in many instances it removes it, by taking off spasmodic action from the stricture. Patients, however, who are subject to occasional retentions of urine from the use of common bougies, are also not less liable to the complaint when they are using armed ones; and sometimes they suffer in a still worse degree.

In certain constitutions, it appears also, that the application of caustic to a stricture brings on an attack of ague. This effect is said to be most common in patients who have past a good deal of their life in hot climates. It sometimes happens, however, in persons who have never been out of England. We saw in St. Bartholomew's hospital, a few years ago, an elderly man who had very bad strictures, for which the caustic was used. After the plan had been followed about a fortnight, a serious shivering fit came on directly after the application of the bougie. The method was discontinued for a time, and the man's health got rather better. The caustic was now again resorted to, and again a most violent rigour immediately followed, and the febrile disposition which took place proved fatal in a couple of days.

Caustic bougies are at present much less employed than they were ten or fifteen years ago. In France, however, and upon

upon the continent in general, the practice never gained any partisans. The great thing which rendered the plan a favourite one with many surgeons some time ago, depended upon its alleged superiority in radically curing strictures, and leaving no chance of a relapse. We believe, however, that this was only a supposition; for we have seen several returns of stricture after the use of caustic; and, if the disease should recur rather less frequently on the whole, the success may be very well ascribed to the larger size of the armed bougies ordinarily employed. In short, we have no doubt, that common bougies would permanently cure strictures quite as well as any armed ones, if care were taken to increase the size of them in a proper degree, in proportion as the obstruction gives way.

For those strictures, however, which are like what would be produced by tying a piece of packthread round the urethra, we think armed bougies generally answer very well. They have also been particularly recommended for irritable strictures, the irritability of which is said to be destroyed with the diseased part of the canal. There are some cases in which no bougie nor catheter, of the smallest size whatever, can be got through the obstruction. Here the surgeon has the choice of using the armed bougie; of exciting ulceration of the stricture with the pressure of a common one; or of imitating the French, and some of our own surgeons, in boldly forcing a way through the obstruction with a conical catheter, of which we shall presently speak.

Treatment of Strictures with other Bougies, armed with the Caustic Potassa.—Mr. Whately considers strictures of the urethra, not merely as contracted fibres, but as really diseased portions of the membrane lining that canal. Hence he has proposed a remedy, calculated, as he thinks, both to remove the diseased affection, and to dilate the contracted part, without putting the patient to the inconvenience of wearing a bougie. Such a remedy he thinks caustic, when it is judiciously used. But his great object is to recommend the employment of the caustic potassa, or kali purum, in a particular manner, as being, according to his own account, more efficacious, and less painful and hazardous, than bougies armed with lunar caustic.

Before the caustic potassa is employed, the urethra ought to be rendered sufficiently capacious to admit a bougie above the smallest size into the bladder; and the strictures, if very irritable, are to have this irritability previously lessened by the use of common bougies.

The following is the manner of arming a bougie with this caustic, according to Mr. Whately's description. Put a small quantity of the caustic upon a piece of strong paper, and break it with a hammer into little bits, about the size of large and small pin's heads. When thus broken, it should be kept for use in a phial, closed with a ground stopper. The bougie must have a proper degree of curvature given to it, by drawing it several times between the finger and thumb of the left hand, and it should be just large enough to enter the stricture with some degree of tightness. Then let it be passed gently into the urethra, and when its point stops at the stricture, which it almost always does before it will enter it, make a notch with the finger-nail on the upper portion of the bougie, exactly half an inch from the extremity of the penis. When the bougie is withdrawn, a small hole, about the sixteenth part of an inch deep, should be made at the extremity of its rounded end. Some of the broken caustic should then be put upon a piece of paper; and a bit, smaller than the smallest pin's head, is to be selected for the first application. Let this be inserted into the hole of the bougie with a pocket-knife, and pushed into it with the blunt end of a pin, so as to place the caustic rather below the margin of the hole. In order to prevent the potassa from coming out, the hole is then to be contracted a little with the finger, and the remaining vacancy is to be filled with hog's-lard. The bougie, being then oiled, is to be passed, with the curvature upward, to the anterior part of the stricture, the situation of which has been ascertained beforehand, and the bougie marked as already explained. The instrument should rest there for a few seconds, for the purpose of letting the caustic begin to dissolve. It should then be very gently pushed forward, about one-eighth of an inch, when there must be another stop for a second or two. The bougie should next be carried forward in the same gentle manner, till it has got through the stricture. After this, it should be immediately withdrawn, by a very gentle motion, to the part at which it was first made to rest awhile. It is next to be very slowly passed through the stricture a second time; but without letting the bougie stop in its passage. If pain or faintness arise, the operation is now to end, and the bougie is to be immediately withdrawn; but if no such effects be produced, the instrument may be passed and withdrawn once or twice more.

Mr. Whately directs the application to be repeated once every seven days; and if the stricture be found dilated, the bougie must be proportionally increased in size every time. The piece of caustic, in no cases whatever, ought to be larger than a common pin's head.

By proceeding in the way above related, Mr. Whately conceives that the caustic will be equally diffused over every part of the strictured surface, and that the application will only abrade the membrane of the stricture, without producing a slough.

It deserves notice, that this method of treatment seems little adapted to strictures, which are confined, as it were, to a point of the urethra; the cases which are also the most frequent, if we are to credit the authority of Mr. Hunter. The possibility of applying the caustic accurately to the place intended has always appeared to us doubtful; and, indeed, notwithstanding there are some good surgeons, who occasionally try the plan and think it answers, we are inclined to ascribe more to the passage of the bougie itself than to any effect of the little bit of caustic on the stricture.

Treatment of Strictures with metallic Bougies.—For some years past, a new plan has prevailed of treating strictures in the urethra with bougies, composed of a soft, flexible metal. The instruments also have a highly polished surface, of a silvery hue; and as the diameter of some of them is considerable, they possess a sufficient degree of firmness, both for introduction, and for retaining the curve of the patient's urethra. This last circumstance, indeed, is considered by some practitioners a great advantage, exclusively belonging to metallic bougies. Hence, as soon as they have received the curvature which is judged to suit the patient best, they are carefully preserved in this form throughout the cure, and are kept in a case which also has a bent shape. Formerly, we have heard of objections to these instruments, on the ground of their being liable to break in the urethra; but, although they are now often used, we have not been acquainted latterly with such an accident. Perhaps this is to be imputed to their present composition, which is firmer and less flexible than it used to be some years ago. Many patients bear the employment of metallic bougies better than any others. It seems only necessary to add, that they effect a cure on the principle of dilatation, like common bougies.

Treatment of Strictures with a conical Silver Catheter.—It is remarkable that the French surgeons, who have always objected to the use of armed bougies, which appear to them too violent a means of cure, have set the example of treating strictures

strictures in the urethra on the principle of actual force. We cannot explain this matter to the reader better than by quoting what Mr. Cross, an intelligent surgeon at Norwich, who lately visited the hospitals of Paris, has said upon the subject. "When I first went to La Charité, (says this gentleman,) out of fifty-three male patients in the surgical ward, there were five cases of stricture of the urethra, and three or four of diseases of the testicles. In the treatment of the former complaint, the caustic bougie is not used in any of the hospitals, and it was censured by all the surgeons I met with, as '*a very dangerous and harsh remedy*,' which I believe most of them have never given a trial to. It appears to me, however, that the Parisian method of treating many cases of stricture in the urethra is not more mild than the use of the caustic." Mr. Cross then recites a case which he saw in La Charité. A man who had had for a long while a permanent stricture, had been repeatedly treated for it. There was difficulty of making water, but not complete retention. Unsuccessful attempts were made, for several days, to pass an instrument into the bladder by gentle means. The patient was still able to void his urine, although with great pain and difficulty. M. Roux took a conical silver catheter, with a very slight curvature, and an extremity almost pointed, and by force regularly applied, he made his way into the bladder in spite of all opposition. He took care to keep the instrument central, and to judge of the direction of the point by the lateral rings. The rule mentioned by M. Roux, for commencing the great depression of the outer extremity of the instrument, was when, by the finger in the rectum, he could feel the point to have reached the apex of the prostate. He gave great pain to the patient, but succeeded in getting the instrument into the bladder. The urine in the bladder was not suffered to flow out immediately, the catheter being left in the urethra, and its end plugged up with a piece of wood. Mr. Cross well observes, that M. Roux acted very judiciously in directing the catheter to be kept depressed between the thighs, because from its shortness, and the smallness of its curvature, the bringing of the outer extremity of the instrument up to the abdomen would have drawn the other extremity out of the bladder.

Three or four days are the time M. Roux commonly keeps the conical catheter in the passage; but this patient suffered so intolerably, that it was taken out at the end of four and twenty hours. An elastic gum catheter, of rather a small size, was immediately introduced without difficulty; its extremity fastened to the abdomen; and its orifice plugged up, in order that the urine might be allowed to flow only at certain periods. The next day the patient was comparatively easy. On the fourth day there was a swelling of the testicle, scrotum, and perineum. A poultice was applied, and the elastic catheter continued. In four days more the swelling of the parts had subsided, and the poultice was no longer necessary. A fresh gum catheter of a larger size was introduced. Suffice it here to add, that in about six weeks a catheter of the largest size could be introduced.

Another case, says Mr. Cross, went on less favourably. The *sonde conique* had been employed, and a gum catheter introduced; but in less than a week the patient, believing he could make water without the instrument, took it out himself. The next day, an effusion of urine in the scrotum had taken place, and the fluid was freely let out by two long incisions. The elastic catheter, however, could not be introduced again. The urine now came away in drops from the urethra. The free incisions in the scrotum prevented sloughing; but the patient, who was very weak, and in bad health, died in a few days. It was, observes Mr. Cross, an inveterate case of stricture, and the patient would probably have died under any treatment. Dissection shewed a diseased bladder, whose coats were above half an inch in thickness; a cartilaginous stricture and extensive sinuses communicating with the once-membranous part of the urethra.

"The effecting of a speedy cure, in bad cases of stricture," is the argument advanced by the French surgeons for the use of the conical catheter, where that of elastic gum cannot be introduced without its assistance. They tell us, says Mr. Cross, even of bad cases being cured, or greatly relieved, in a month or six weeks; and certainly in one case, under M. Roux, a catheter of the largest size could be received by the urethra, a month from the introduction of the conical catheter.

M. Roux assured Mr. Cross, that he had never seen any inflammation or irritation from this treatment, which was not readily managed and subdued. In his clinical lecture, however, he mentioned two fatal cases, which he had witnessed, and examined after death. In one of these, on taking out the *sonde conique d'argent* the third or fourth day after its introduction, the surgeon could not introduce the gum catheter: in attempting to do which, said M. Roux, another passage seemed to have been made. Extravasation of the urine, sloughing, and death ensued. The second case was somewhat similar; peritoneal inflammation was the immediate cause of its fatal termination, the instrument having passed between the pubes and anterior part of the bladder.

Whoever desires more information respecting this violent mode of treating strictures, must consult Mr. Cross's publication. Enough, we conceive, has been said to prove that it is a dangerous plan, which can only be justifiable in the most inveterate and obstinate cases. It seems that, in such examples, the late John Hunter also used the silver catheter with considerable force; and the practice of Mr. Pearson and of Cooper is likewise cited, as a sanction of this bold mode of proceeding. The French even sometimes prefer this way of puncturing the bladder, the catheter being forced through the prostate gland; and we have heard of one or two distinguished surgeons in this country, who never perform any of the ordinary methods of puncturing the bladder, but invariably succeed in getting a catheter into that organ, by forcing the instrument forward through the prostate gland. See Hunter's Treatise on the Venereal Disease. Whately's improved Plan of treating Strictures. First Lines of Surgery, edit. 3. Sir E. Home's Practical Obs. on Strictures. C. Bell's Letters on Dis. of the Urethra. Cross's Sketches of the Medical Schools of Paris, &c.

Urethra, *Imperforate*. Children, when first born, are sometimes incapable of making water, in consequence of the prepuce or urethra being imperforate. In the first case, the nurse takes notice that the child's linen is not wet, and the extremity of the penis presents a soft, oblong, shining, transparent tumour, occasioned by the collection of the urine between the prepuce and the glans. Relief is to be given by making an incision into the anterior and inferior part of the swelling, and thus opening the prepuce. The fresh-cut surfaces are then to be kept apart with a dossil of lint, until healed. When the prepuce is very long, it is even recommended to cut off a piece of it, in order to remove all risk of a phymosis.

When the inability to evacuate the urine depends upon an imperforate state of the canal of the urethra, the membrane which closes its orifice is to be opened with a lancet, and a piece

piece of lint introduced between the sides of the puncture, until they are cicatrized.

In the female subject, the meatus urinarius is sometimes found imperforate, though less frequently so than the vagina. As soon as a surgeon is apprised of the cause of a young female child not being able to void its urine, he is to divide the membrane which closes the orifice of the meatus urinarius. The frequent evacuation of the urine, and the introduction of a small dossil of lint, will prevent the sides of the incision from growing together again. An imperforate urethra in the female subject has been known to give rise to an urinary fistula at the navel. In this case, the retained fluid makes its way by the urachus to the umbilicus. The urachus, which in the adult is solid and ligamentous, contains in some subjects an inconsiderable cavity, which ascends more or less towards the navel. It is conceivable, that in such individuals, who are analogous to quadrupeds, in which the urachus is a true canal, the urine may ascend along this process to the navel, elevate the skin there, and at length makes its way out, and cause a fistula in the same situation. Even when the urachus is solid, it is possible that the lining of the bladder may be propelled in this direction, and protrude also at the umbilicus, where it may afterwards burst. However it may be, nothing is more certain than the possibility of the urine ascending along the urachus, and the formation of an urinary fistula at the navel, in young female children, in whom the urethra is imperforate. Cabrol's twentieth observation affords a complete proof of the fact. In a case of the same kind, we could not also do better than imitate the practice, which this practitioner adopted. It consisted in first establishing the natural passage for the urine by a suitable incision, and the use of an elastic gum catheter. A ligature was then applied round the fungous protuberance at the navel, where the urine had been previously discharged. Perhaps, however, the latter proceeding would generally be unnecessary, because, unless the fistula had existed very long, it would spontaneously heal, on the urine finding its natural outlet.

Urethra, *Orifice of, Misplaced.* In speaking of malformations of this passage, it deserves notice that the orifice of the urethra is not always found situated at the anterior part of the glans. This particular case, which is not very uncommon, is termed by surgeons *hypospadias.* It presents the following varieties:—Sometimes the orifice of the urethra is below the glans; sometimes it is very far back, near the crura of the penis, but still at the under surface of this organ. There are also cases, in which the urethra is found situated above the corpora cavernosa; and the malformation ought then to be called *epispadias.* Richerand mentions having seen a remarkable instance of this description in a young conscript. The penis was extremely short; so much so, that, at first view, there seemed to be only the glans, which, in the flaccid state of the parts, was the only thing visible in front of the pubes. Along the upper part of the base of the glans there was a fissure, which extended through the skin of the dorsum of the penis, resembling a vulva of about an inch in length. The malformation, termed *hypospadias,* causes no impediment to the evacuation of the urine; and it is even asserted, that it does not certainly deprive the individual of the generative power. The truth of this observation must depend very much upon the exact situation of the orifice of the urethra; for if it were towards the perineum, impotence must be the consequence. In this latter kind of case also, no attempt at a cure would be practicable; though, perhaps, when the orifice is near the glans, something might be done, with a view of forming a continuation of the passage to its proper extent. Such, however, would be the tendency of any new opening to close again, that the result would be very uncertain; and we believe that the records of surgery evince no facts in favour of the trial.

There is another serious malformation of the urethra, which consists in a preternatural shortness of it. The canal does indeed extend to the glans penis, where it terminates in the usual way; but its actual length does not correspond with that of the corpora cavernosa. Hence, a permanent curvature of the penis is produced, and the perfect erection of this organ is hindered. The case is said to be entirely incurable.

Urethra, *Calculi lodged in.* Stones of moderate size may escape from the bladder, and, lodging in different parts of the urethra, may occasion great pain, and a difficulty of making water. An instance has been recently published, in which a stone in the urethra was mistaken for a stricture, and the caustic actually applied. (See Marcet on Calculous Disorders, p. 9.) Whatever may be their situation in this canal, their evacuation ought to be promoted by all such means as tend to relax the passage; as bleeding, the warm bath, fomentations to the perineum, diuretic drinks, and the injection of oil into the passage. These means are to be assisted by the gentle and skilfully directed pressure of the fingers, applied just behind the foreign body. When a very small calculus is suspected to be in the bladder, and it will not pass through the urethra, M. Delpech has lately proposed dilating the passage as much as possible with elastic gum catheters; and when the largest instrument can be introduced, he thinks a good chance of the calculus being voided might be obtained, by suddenly withdrawing the large catheter, and desiring the patient to void his urine as forcibly as possible. Particular forceps have likewise been constructed for the extraction of calculi from the urethra; but they seldom answer, except when the foreign body is near the orifice, and would soon escape of itself. A tobacco clyster has been known to effect the discharge of a calculus from the urethra. See Edinb. Med. Surg. Journ. vol. xii. p. 373.

When all the foregoing proceedings are ineffectual, and the patient suffers a good deal of pain and inconvenience, it becomes the duty of the surgeon to cut down to the calculus, and extract it. The patient should then wear an elastic gum catheter for a few days, until the opening is healed. The writer of this article was once consulted by a gentleman's coachman, who had contrived to let a large head-dress pin slip a considerable way into the urethra, so that he could not get it out again. The point of the instrument, in fact, was more than three inches from the orifice of the urethra. Its extraction was easily accomplished, by pushing its point through the urethra, when it was taken hold of, and withdrawn as far as it could be in this manner. The head of the pin was then pushed towards the mouth of the canal, and the whole instrument extracted.

Urethra, *False Passage in.* One of the greatest evils, arising from the unskilful and too violent use of catheters, bougies, and other instruments, is the formation of a new or false passage, by the rupture of the urethra. Whenever an instrument is afterwards introduced, it does not follow the course of the urethra, but enters the ruptured opening. Thus, the difficulty of curing the stricture, if there be one, is seriously increased, because the surgeon can hardly ever get the bougie to reach it again; and if his object is to pass an instrument into the bladder, he is equally frustrated. Nothing seems more likely to cause a false passage, than the violent use of the conical silver catheter, in cases of bad strictures;

ftrictures; a plan which is now in vogue at Paris, and of which we have already delivered an account in a foregoing column. The formation of a falfe paffage is alfo a dangerous accident, inafmuch as it may give rife to an extravafation of the urine, floughing of the perineum and fcrotum, and even death itfelf.

When a furgeon has reafon to fufpect that there is a recent falfe paffage, perhaps his wifeft plan is to defift from the introduction of inftruments into the urethra, and keep the patient very quiet for a few days, in order to take the chance of the breach of continuity being repaired. If, however, the urine fhould be effufed, he would be warranted in attempting to pafs an elaftic gum catheter, without any delay, in the hope of ftopping the increafe of the extravafation. Were the effufed fluid confiderable, he would alfo be called upon to make immediately one or two free incifions, for the fame purpofe. Should he be fo fortunate as to fucceed in getting a catheter introduced, the patient muft be directed to wear it for feveral days, without interruption. In this manner, the urine would be conveniently difcharged, and the falfe paffage perchance heal up.

Mr. Hunter has advifed the performance of the following operation for the cure of a falfe paffage:—Pafs a ftaff into the urethra, as far as it will go, which will probably be to the bottom of the new paffage; and this, we may be fure, is beyond the ftricture. Feel for the end of the inftrument externally, and cut upon it, making the wound about an inch long, if the difeafe be before the fcrotum; and an inch and a half, or more, if in the perineum. If the new paffage be between the urethra and body of the penis, you will moft probably get into the found urethra, before you come to the inftrument, or new paffage. If fo, introduce a probe into the urethra, through the wound, and pafs it towards the glans penis, or, in other words, towards the ftricture. When it meets with an obftruction, this muft be the ftricture, which is now to be got through, and afterwards dilated. To complete the operation, withdraw the probe, and, inftead of it, introduce a cannula forward to the ftricture. Then pafs another cannula from the glans downward, till the two tubes are oppofite each other, having the ftricture between them. While an affiftant holds the cannulæ in this pofition, the ftricture is to be perforated with a fharp inftrument, introduced through the upper cannula. A bougie is then to be introduced into the cannulæ, through the perforated ftricture, and the tubes are to be withdrawn. The bougie is now to be paffed into the bladder, and worn. Inftead of bougies, modern furgeons would now invariably prefer, in fuch cafes, elaftic gum catheters, which allow the patient to make water with convenience, create lefs irritation than common bougies, and can be worn for a longer time, which are great confiderations, in addition to the important advantage of keeping the urine from paffing either through the wound, or the falfe paffage. Befides the foregoing fteps, it would be neceffary, in fome old cafes, to lay open the falfe paffage before it would heal.

URGAS, in *Ancient Geography*, a town of Hifpania, in Bœtica, at fome diftance to the left of Bœtis, and weft of Corduba, belonging to the Turduli, furnamed *Alba* by Pliny.

URGEL, in *Geography*, a town of Spain, in Catalonia, the fee of a bifhop, fuffragan of Tarragona; 65 miles N.N.W. of Barcelona. N. lat. 42° 24′. E. long. 1° 22′.

URGENUMÆ, in *Ancient Geography*, a town of Gallia Narbonnenfis, according to Strabo: the *Ernagium* of Ptolemy.

URGHENTZ, or URGENTZ, in *Geography*. See URKONJE.

URGI, in *Ancient Geography*, a people of European Sarmatia, between the Danube and the Boryfthenes.

URGNANO, in *Geography*, a town of Italy, in the department of the Serio; 5 miles S. of Bergamo.

URGO, in *Ancient Geography*, an ifland fituated on the coaft of Etruria. Pliny fays that it was larger than the ifland Plantaria, and that it took the name of Gorgon.

URI, a people of India, on the bank and towards the fource of the river Indus. Pliny.

URI, in *Geography*, a canton of Switzerland, bounded on the north by Schweitz, on the eaft by Glaris, on the fouth by the Italian bailiwicks, and on the weft by Underwalden, about 60 miles in length, and 28 in breadth. It confifts almoft every where of high mountains and deep valleys; the fummits of the former of which are perpetually covered with ice and fnow. The loftieft among them, and indeed the higheft in Europe, is that of St. Gothard. On the Alps in this canton, during the fummer, are fattened many thoufand heads of cattle; and the cheefe is famed for its goodnefs. The vales between the high mountains here in fummer are very hot and fertile, when not expofed to the northern winds; among the mountains too are found numbers of beautiful cryftals; the greateft part of which are bought up, and fent off to Italy to be wrought. In this canton are only market-towns, villages, and fcattered houfes; and the inhabitants, being inured to a rough and hard way of living, are hardy, vigorous, and brave, and ftrenuous affertors of that liberty which was fo dearly purchafed by their patriotic anceftors. They are all Roman Catholics. They were once as a free people, immediately under the jurifdiction of the empire. An union between Uri, Schweitz, and Underwalden, for throwing off the Auftrian yoke, was effected in the beginning of the year 1308; and in 1315, thefe three cantons entered into a perpetual alliance. At that time Uri held the firft place among the confederates, but at prefent only the fourth, though among the fix leffer cantons it is ftyled the firft. Its government is democratical, like that of *Schweitz;* which fee.

Thefe two cantons, including their fubjects, contain about 50,000 fouls; and, in cafe of neceffity, could furnifh above 12,000 militia. The fame kind of foil, and the fame productions, are common to the two cantons: the whole country, being rugged and mountainous, confifts chiefly of pafture, produces little corn, and has no vines. The natives, however, have improved a barren foil into a wonderful ftate of fertility. The purity, or, as fome would call it, the aufterity of morals, which ftill prevails among thefe people, cannot eafily be conceived by the inhabitants of opulent cities. The beautiful defcription given in Goldfmith's "Traveller" is peculiarly appropriate to thefe people.

> "Dear is that fhed to which his foul conforms,
> And dear that hill which lifts him to the ftorms:
> And, as a child, when fcaring founds moleft,
> Clings clofe and clofer to the mother's breaft:
> So the loud torrent, and the whirlwind's roar,
> But bind him to his native mountains more."

The capital of this canton is Altorf.

URIA, in *Ancient Geography*, a town of Italy, in Apulia.—Alfo, a town of Italy, in Meffapia, upon the Appian way. (Strabo.) Herodotus calls it Hyria, and fays that it was founded by the Cretans, about a century before the fiege of Troy.—Alfo, the name of a lake of Acarnania.

URIAS, a fmall gulf of Italy, difficult of entrance.

URIBACO, in *Ichthyology*, the name of a Braſilian ſea-fiſh, eſteemed a very well-taſted and wholeſome one. It is ſomewhat of the figure of the perch; its back is rigid, and its belly is ſomewhat protuberant. It grows to ten or twelve inches long. Its teeth are ſmall and ſharp, and the ends of its gills and gill-fins terminate in a triangular point: its belly-fins are ſuſtained by a very rigid and ſtrong ſpine: its long fin, behind the anus, is ſupported by flexile and ſhort ſpines; it has only one fin on the back, equally broad, and, reaching nearly to the tail, ſupported by prickly rays; its tail is deeply forked; its ſcales are of a fine ſilvery white, with a faint caſt of pale but bright red; its belly-fins are white, and its back-fin and tail reddiſh: its ſide-lines are broad, and of a fine red; over theſe and under them, near the tail, there is on each ſide a large black ſpot. Margraave. Ray's Ichthyol. p. 338.

URIC ACID, in *Chemiſtry*. This ſubſtance was diſcovered by Scheele in 1776. The French chemiſts named it *lithic* acid, from its being a common ingredient in urinary calculi, but Dr. Pearſon ſubſequently changed its name to that by which it is at preſent generally known. The original name, however, is likely to be again adopted, as Dr. Marcet has adhered to it in his recent work upon urinary calculi.

Uric acid ſeparates ſpontaneouſly from ſome urine in the form of red granular cryſtals; or it may be procured more readily in this impure ſtate by the addition of either of the mineral acids to the urine. The beſt way of obtaining it in quantity, however, is to diſſolve urinary calculi compoſed chiefly of it in an alkaline lixivium, and to precipitate it from this by a mineral acid. Uric acid, thus obtained, and afterwards repeatedly well waſhed, has the following properties.

It appears in the form of a beautiful white powder, which feels rather harſh, but not gritty, and is deſtitute both of taſte and ſmell. According to Dr. Henry, it diſſolves in about 1150 times its weight of water at 21°, or in about 1720 times at 60°. In boiling water it is more ſoluble, and its ſolution faintly reddens litmus. It readily diſſolves in ſolutions of the fixed alkalies, but not ſo readily in ammonia. It is incapable of decompoſing the alkaline carbonates, or any earthy or metallic ſalt. The nitric acid diſſolves it, and when this ſolution is evaporated to dryneſs, it aſſumes a beautiful pink colour, which becomes of a fine carmine hue on the addition of water. This colour is not permanent if expoſed to the action of the air; but paper ſtained with it, and dried and kept in cloſe veſſels, retains the colour for a long time. Chlorine produces a ſimilar effect upon this acid; an effect which is quite peculiar, and therefore characteriſtic of it. On being ſubjected to heat, uric acid emits a ſtrong odour, and yields a large proportion of pruſſic acid. Submitted to diſtillation in cloſe veſſels, it yields a principle of a peculiar nature, which Dr. Henry has aſcertained to be a diſtinct acid. According to Dr. Prout's analyſis, uric acid conſiſts of

		or per cent.	
1 atom or 1 volume of hydrogen	1.25	hydr.	2.857
2 atoms or 2 volumes of carbon	15.00	carb.	34.286
1 atom or ½ volume of oxygen	10.00	oxyg.	22.857
1 atom or 1 volume of azote	17.50	azote	40.000
	43.75		100.000

Dr. P., therefore, ſeems diſpoſed to conſider it as compoſed of one atom or volume of cyanogen, and one atom or volume of water.

Uric acid combines with the alkalies and alkaline earths, and forms a ſet of ſalts, none of which are very intereſting, except the *ſuperurate of ſoda*, which conſtitutes the *gouty* calculus, or *chalkſtone*. The urates may be formed by boiling the baſe with an exceſs of acid in a proper quantity of water, filtering the ſolution, and evaporating it to dryneſs. The urates of potaſh, ſoda, ammonia, barytes, ſtrontites, lime, magneſia, and alumina, obtained by the preceding proceſs, are neutral, have neither taſte nor ſmell, and can ſcarcely be diſtinguiſhed from uric acid itſelf. They diſſolve with great difficulty in water, urate of ammonia being moſt ſoluble, and urate of barytes the leaſt. They all appear, however, to form ſubſalts much more ſoluble than the neutral ſalts. See URINARY *Calculi*.

URICACHI, in *Geography*, a town of New Navarre; 160 miles S.S.E. of Caſa Grande.

URICONIUM, VIROCONIUM, or *Vrioconium*, in *Ancient Geography*, a town of Great Britain, in the ſecond Itin. of Antonine, between Rutanium (near Wem) and Uxacona (near Sheriff Hales). It belonged to the Cornavii, and was ſituated at Wroxeter, in Shropſhire, on the N.E. ſide of the Severn, about three miles from Shrewſbury; which is ſuppoſed to have riſen out of the ruins of that ancient city. At Wroxeter many Roman coins have been found, and the veſtiges of the walls and ramparts of Uriconium are ſtill viſible. It is highly probable, that the neighbouring mountain, the Wrekin, derives its name from Uriconium; for it preſerves the ancient Britiſh name Urecon.

URIE WATER, in *Geography*, a river of Scotland, which runs into the Don, near Inverarie.

URIES, CAPE, a cape on the N. coaſt of Staten iſland. See STATEN *Iſland*.

URIGNY, a town of France, in the department of the Loiret; 6 miles S. of Pithiviers.

URIGO, a burning with a cauſtic, or cautery.

VRIHASPATI, in *Aſtronomy*, is the Hindoo name of the planet Jupiter. In an invocation to the different planets, given in the ſeventh volume of the Aſiatic Reſearches, he is thus addreſſed: "O Vrihaſpati! ſprung from eternal truth, confer on us abundantly that various wealth, which the moſt venerable of beings may revere; which ſhines glorious among all people." Intellectual wealth is probably here meant; Vrihaſpati being preceptor to the gods, the moſt venerable of beings. He is alſo their meſſenger in intercourſe between the three principal deities, being proverbial for eloquence. A cycle is called after Vrihaſpati; and it is the name of a celebrated legiſlator; ſo that this name, originally probably of ſome highly gifted perſon, occurs very frequently in aſtronomical and legal points; though in others, whatever hiſtorical facts may be connected with it, he is hidden in the veil of mythological fable. (See SANI, the Saturn of the Hindoo zodiac.) As with the weſtern aſtrologers, Friday is with the Hindoos the day of Vrihaſpati, or Jupiter. (See ZODIAC.) He is repreſented of golden aſpect, clothed in red, bearing a lotos, and a ſtaff in his hands; and ſometimes mounted on a boar. Many of the Hindoo deities have vehicles aſſigned them, which are called *vahan*. See under that word for an enumeration of many of them.

Under our article SULTEE, the authority of Vrihaſpati as a legiſlator is quoted; as it is very frequently in Colebrooke's valuable digeſt of Hindoo law. In the article SIVA, that important perſon of the Hindoo triad is ſaid to guide the motions of the planet Jupiter, as Viſhnu does thoſe of the ſun, and Brahma of Sani, or Saturn. And under TARA we have given a legend, ſufficiently ridiculous, if taken literally, of Vrihaſpati having begotten a monkey ſo named;

named; but we refer to the article descriptive of the cause of so strange a fiction.

The name of Vrihaspati occurs often in the Vedas; a proof of the early age of the person, whoever he was, that first bore the name. He had a daughter named Romasa, married to the king Bhavayavya; but we have no particulars of their history. Angiras, one of the holy persons to whom the Veda was revealed, is sometimes called father of Vrihaspati; other authorities say Devala was his father.

In the Ramayana, Vrihaspati is called Vachaspati, and noticed as proverbial for eloquence. The name may be translated lord of speech. See VACH.

URIM *and Thummim*, אורים תמים, q. d. *light and perfection*, the name of a kind of ornament belonging to the habit of the Jewish high-priest; in virtue of which he gave oracular answers to the people.

The high priests of the Jews, we are told, consulted God in the most important affairs of their commonwealth, and received answers by the urim and thummim. What these were is disputed among the critics: some take them to be the twelve precious stones in the priest-plate of the high-priest, on which were engraven the names of the twelve tribes of Israel; and they maintain that the oracle gave its answer to any question proposed, by causing such letters in them to shine with superior lustre, or to appear prominent above the rest, as formed the words of the answer; or by an audible divine voice pronouncing the words, the high-priest was prevented from mistaking the answer. Josephus, and some others, imagine, the answer was returned by the stones of the breast-plate appearing with an unusual lustre, when it was favourable, or in the contrary case, dim. Others suppose, that the urim and thummim were something enclosed between the folding of the breast-plate; this some will have to be the tetragrammaton, or the word יהוה, *Jehovah*. Christophorus de Castro, and after him Dr. Spencer, maintain them to be two little images shut up in the doubling of the breast-plate, which gave the oracular answer from thence by an articulate voice. Accordingly, they derive them from the Egyptians, who consulted their lares, and had an oracle, or teraphim, which they called truth. This opinion, however, has been sufficiently confuted by the learned Dr. Pococke, Comment. on Hosea, chap. iii. 4. and by Witsius in his Ægyptiaca, lib. ii. cap. 3. 10, 11, 12. The more common opinion among Christians concerning the oracle by urim and thummim, and which Dr. Prideaux espouses, is, that when the high-priest appeared before the veil, clothed with his ephod and breast-plate, to ask counsel of God, the answer was given with an audible voice from the mercy-seat, within the veil: but, it has been observed, that this account will by no means agree with the history of David's consulting the oracle by Abiathar; 1 Sam. xxiii. 9. 11. chap. xxx. 7, 8. because the ark, on which was the mercy-seat, was then at Kirjathjearim; whereas David was in the one case at Ziklag, and in the other in the forest of Hareth. Braunius and Hottinger have adopted another opinion: they suppose, that when Moses is commanded to put in the breast-plate the urim and thummin, signifying *lights* and *perfections* in the plural number, it was meant that he should make choice of the most perfect set of stones, and have them so polished as to give the brightest lustre: and on this hypothesis, the use of the urim and thummim, or of these exquisitely polished jewels, was only to be a symbol of the divine presence, and of the light and perfection of the prophetic inspiration: and as such, constantly to be worn by the high-priest in the exercise of his sacred function, especially in consulting the oracle. See Prideaux's Connection, vol. i. p. 123, &c. Jennings's Jewish Ant. vol. i. p. 233, &c.

Diodorus Siculus relates, that there was also a ceremony in use among the Egyptians, whose principal minister of justice wore a collar of precious stones about his neck, which was called αληθεια, or truth.

URIMA, in *Ancient Geography*, a town of Asia, situated on the western bank of the Euphrates, S.E. of Samosata.

URIMAO, in *Geography*, a town of Mexico, in the province of Mechoacan; 35 miles N. of Zacatula.

URINAL, in *Domestic Economy*, a vessel fit to receive and hold urine; and used accordingly for the conveniency of sick persons. It is usually of glass, and crooked; and sometimes it is filled with milk, to assuage the pain of the gravel.

URINAL, in *Chemistry*, is an oblong glass vessel, used for making solutions, and so called from its resemblance to the glasses in which urine is set to settle, for the inspection of the physician.

URINARIUM, in *Agriculture*, a name sometimes applied to a sort of reservoir, or place constructed in the ground for the reception of urine, and the liquid matters discharged from the stables, cattle-sheds, pig-sties, and other places situated about the farm-yard.

It may be noticed, that a bason or receptacle of this nature is essential to every well-contrived farm-yard; as by blending vegetable, earthy, and other similar materials with these liquids, a vast increase of valuable manure may be readily and conveniently provided. These basons should always be formed in the most shady parts of such yards or places, and be well connected with the buildings destined for the horses, cattle, pigs, and other sorts of live-stock. In particular situations, too, they may be so contrived as to be capable of being discharged and thrown over the grass-lands that may lie below them. An useful and well-contrived cavity or reservoir of this sort is described by Mr. Pew in the seventh volume of the Bath Letters and Papers, in which the cow and other cattle-stalls are said to be placed on the side of a nap, or small elevation; and that, by means of gutters formed behind, the liquor is conveyed into a sink or drain, which runs under the stable, where, by the help of another drain or sink, it meets with the stable liquor; and these, with that from the pig-sties, run through an under-ground drain into the receptacle or reservoir. It is the practice of the proprietor, it is said, to put all sorts of refuse vegetable and animal matters into this receptacle, where it quickly rots; and when the weather turns moist, he has it stirred well up with poles, when it is discharged over a meadow that lies below, or any particular part of it, by means of trenches cut for the purpose, which is in this way rendered, it is asserted, astonishingly fertile and productive, as well as much more early than even watered lands. It is suggested, further, that this plan might be extended, by having the stables, in such cases, placed on the centres of the knolls, as in this case three or four reservoirs might be formed; and that by stopping some drains, and opening others, the fluid contents might be directed one year to one side and another year to another side, as circumstances might render necessary.

These kinds of reservoirs are sometimes so situated in respect to the dung-steads, as to have pumps fixed in them for throwing the urine and liquid matters over the manure heaps, as by that means much waste of such matters is prevented, and the dung greatly improved. Besides, in this way, such fluid materials can be the most readily dispersed over different sorts of rich earthy substances, and the increase of manure be

be thereby the most fully and conveniently promoted. See Manure and Yard-*Dung*.

URINARIUS Meatus, in *Anatomy*, the urethra of the female. See Urethra.

URINARY Abscesses, in *Surgery*, are so called when an extravasation of urine in the cellular membrane of the scrotum, penis, perineum, &c. excites suppuration in the parts, so that purulent matter and urine are found mixed together in the tumour. Such an effusion of urine always arises from a breach of continuity in the bladder or urethra, most frequently in consequence of the distention of that viscus in obstinate, protracted, and improperly treated retentions of urine; or in consequence of abscesses, which form in the course of the urethra, and burst into that canal. The making of a false passage in the urethra, by the unskilful use of bougies and catheters, and the laceration of this tube by forcible contusions, are also common causes of an extravasation of urine. There is not in the whole body any fluid, whose extravasation produces more serious mischief than the urine. If it be not promptly discharged, it soon excites a putrid suppuration in the cellular membrane containing it; makes this part slough; causes mortification of the skin; and a gangrenous inflammation of every structure with which it comes into contact.

When the opening, by which the urine has escaped from the bladder, is situated either in this viscus or the urethra, there are invariably two principal indications to be fulfilled. The first is to prevent the further increase of the extravasation, by introducing a catheter, drawing off the urine, and desiring the patient to wear the instrument. The second indication is to give an outlet to the effused urine; so that the mischief, likely to result from its presence in the cellular membrane, may be lessened as much as possible. This is effected by suitable incisions, which also have the good effect of tending to hinder the urine from spreading more extensively amongst parts, in which it would be sure to produce inflammation, abscesses, and gangrene.

The manner of opening such collections varies according as the urine may be in one cavity, or widely effused in the cellular membrane. In the first case, a simple incision, the whole length of the cavity, will suffice for emptying and healing it. In the second, if the extravasation is extensive, the incisions must be multiplied. It would be absurd to spare the parts; for all those with which the urine has come into contact seldom escape mortification. The incisions which are made hardly ever have the effect of saving them; but, by accelerating the discharge of putrid sanies and stagnant urine, they prevent the mischief which would originate from their further lodgment. If these incisions, however, were practised a few hours after the extravasation, and before suppuration, the parts might be completely freed from urine and preserved. When the operation is at all delayed, their destruction is inevitable. The approach of mortification is indicated by the crepitation under the bistoury, resembling the kind of noise produced by tearing parchment. The extent and depth of the incisions must be proportioned to those of the abscess. When the extravasation occupies the scrotum, long deep scarifications should be made in that part, as well as in the skin of the penis, and in every place where the urine is effused.

Practitioners, unaccustomed to see such diseases, would be alarmed at the extent of the sore produced by the separation of the eschars. Sometimes the whole scrotum, skin of the penis, and that of the groins, perineum, and upper part of the thigh, mortify, and the naked testicles hang by the spermatic cords in the midst of this enormous ulcer. It is hardly conceivable how cicatrization could take place over the exposed testicles; but the resources of nature are unlimited. She unites the testicles and the cords to the subjacent parts; and, drawing the skin from the circumference to the centre of the ulcer, she covers these organs again, and furnishes them with a sort of new scrotum. This statement is founded upon numerous cases, in which nature always followed this course. The cicatrization of the ulcer is even more expeditious than might be expected, considering its extent. In all this business, what does art do? If the introduction of the catheter be excepted, which, indeed, is absolutely necessary for the radical cure, her assistance is very limited, and almost nothing, in the generality of instances; for when the patients are not exhausted by the tediousness of the disorder, when they are of a good constitution, and in the prime of life, they get well as quickly and certainly, with the aid of a good diet and simple dressings, as when they take internal medicines, and use a multiplicity of compound topical applications. The practice of Default at the Hôtel-Dieu consisted in applying emollient poultices, until the sloughs were detached. The ulcer was then sometimes dressed with pledgets charged with styrax; but frequently mere dry lint was used, and continued till the cure was completed. If any complication occurred in the course of the treatment, suitable remedies were prescribed for it. Thus when prostration of strength, and tendency to sloughing existed, bark, cordials, and antiseptics were ordered. But in every case, the catheter is the essential means of cure; without it, the treatment is almost always imperfect, and the ulcer will not heal without leaving several urinary fistulæ. See Œuvres Chirurgicales de Default, par Bichat, tom. iii. p. 277—287.

Urinary *Calculi*. The formation of concretions in the urinary passages being occasioned by the precipitation and consolidation of particular ingredients in the urine, calculi must of course be liable to occur in any of the cavities to which the urine has access. In fact, experience proves that they are frequently met with in the kidneys, ureters, bladder, and urethra. It is commonly believed, that most of them are originally formed in the kidneys, from which organs they afterwards descend with the urine into the other mentioned parts. We must however regard, as exceptions to this observation, the cases in which calculi are formed round foreign bodies, introduced into the bladder through the urethra, the digestive organs, or some accidental wound. In the centre of urinary calculi, surgeons have often met with bullets, splinters of bone, bits of wood, pins, &c. Nor is it necessary for such foreign bodies to be large, in order to produce this effect: a clot of blood, or a little bit of chaff, if not very soon voided, appears to be capable of causing a precipitation of the urinary salts.

That urinary calculi are in many instances originally produced in the kidney, we have the most unequivocal proofs; first, from the severe pain which the passage of such foreign bodies down the ureter always excites; and, secondly, from their being often discovered in the infundibula and pelvis of that viscus after death. This last fact is well illustrated in the first plate of Dr. Marcet's interesting Essay on the Chemical History and Medical Treatment of Calculous Disorders. The engraving is taken from a preparation in the museum of Guy's hospital. In this instance, there were several calculi closely pressed against each other; but, in another example, drawn from a specimen in Mr. Abernethy's museum, the renal concretion was composed of a single mass, which represented a complete cast of the pelvis and part of the infundibula of the kidney. In this form of the disease, the

the kidney loses at last all vestiges of its natural structure, and is converted into a kind of cyst, filled with the extraneous substance. As Dr. Marcet observes, when such a complete alteration of structure takes place, the secretion of urine must of course be entirely carried on by the other kidney. This, however, in some instances, is attended with so little inconvenience as almost to escape notice; and it sometimes even happens, that both kidneys are diseased in a very great degree, and yet life is preserved for a considerable time. Op. cit. p. 3, 4.

Calculi are sometimes found in the ureters, especially at their upper part; but it is not supposed that they are in general originally formed in that situation; an event not likely to happen, unless there be some cause obstructing or retarding the descent of the urine through those tubes. The common belief is, that all calculi found in the ureters are first produced in the kidneys, from which they afterwards descend in the course of the urine.

The generality of calculi, however, which leave the kidney, are of small size, and consequently, after a time, and exciting some pain and inconvenience, they usually get into the cavity of the bladder. Indeed, as Dr. Marcet remarks, the bladder is the most frequent seat of calculi, not only because all urinary concretions, or their nuclei, formed in the kidneys tend to fall into that organ, but also because a stone may be, and probably often is, originally formed in the bladder itself.

It is, however, in the infundibula and pelvis of the kidney, that the first nuclei of urinary calculi are commonly produced. Renal concretions vary considerably in their number, size, and shape. In some cases, a single small calculus has been found occupying one of the foregoing situations; while, in other instances, an innumerable collection of calculous substances are observed filling the whole of the cavity of the pelvis and infundibula of the kidney, distending its parietes, and even obstructing the passage of the urine out of this viscus, which is converted into a sort of membranous cyst. Lastly, a single stone in the kidney may acquire a very large size there; or a great number of small calculi, in the same situation, may become cemented together by the deposition of fresh concreting matter between them, so as to form one mass of enormous dimensions, and the shape of which invariably corresponds to the space in which it is, as it were, moulded. Hence it is, that renal calculi often present a variety of odd irregular figures, resembling those commonly observed in specimens of coral.

We have already remarked, that urinary concretions of large size very often exist in the kidney, without their presence being indicated by any external circumstances, or attended with any symptoms, sufficiently unequivocal to constitute a ground for suspecting the importance of their cause. On the other hand, it is very usual for renal calculi, of middling dimensions, to excite serious and alarming complaints. The reason of this difference becomes obvious, when it is recollected that smallish concretions are readily carried with the urine into the ureter, and become fixed in the narrow portion of the tube. But very large calculi can be contained only in the upper part of this canal, where its parietes are more yielding, and the space in them more capacious.

Calculi of middling size, in their passage through the ureter, cause, at first, a feeling of heaviness, or an indeterminate sense of uneasiness, and an obtuse pain in the region of the corresponding kidney. These complaints occur at intervals of greater or less duration. At length, the pain grows more urgent and annoying, attended with flatulence, heartburn, frequent vomiting, painful retraction of the testicle, and sometimes acute fever. The patient makes water frequently, and in small quantities at a time; and the urine is high-coloured and bloody. The patient cannot sit upright, his body being bent forwards towards the affected side. These symptoms may have more or less duration, and then suddenly cease. They may also subside and recur several times successively, with intervals of some days. In the latter case, the pain is felt at each attack to be situated lower in the track of the ureter. Lastly, when the symptoms have entirely disappeared, the urine is more abundant, not so high coloured, and easily discharged, the stream sometimes bringing out with it the urinary concretion, which has now entered the bladder.

Suppuration of the kidney, and an abscess in the lumbar region, in consequence of renal calculi, are not very common events. This, however, is the only case of the kind, in which the interposition of surgery can be useful. By adverting to previous circumstances, and the irregularity of the pain about the kidney, the practitioner may suspect the nature of a phlegmonous tumour in the situation of this viscus. Whatever may be his conjectures, however, he must carefully abstain from the use of his lancet, until purulent matter is obviously under the integuments. He may then safely make an opening, from which urine and pus will be discharged, and through which the calculi themselves may sometimes be felt and extracted. If they should not be readily touched with a probe, let not the surgeon rashly conceive, that he is justified in endeavouring to discover them with his knife. Their situation may be such as to baffle all his endeavours, and the operation itself might cause a most dangerous hemorrhage, and other fatal mischief. The opening of an abscess of the kidney may remain a long while fistulous, and the circumstance may indeed warrant the conclusion, that the healing is prevented by the presence of some extraneous substances; but a prudent practitioner will never think of performing any operation for their extraction, before nature has brought them tolerably near to the surface.

Urinary calculi, which form upon foreign bodies accidentally introduced into the bladder, and acting as nuclei, are always single, unless the number of foreign bodies themselves happen to be greater. It is curious also to find, from the observations of Dr. Marcet, that, in such instances, the deposition most frequently, if not always, consists of the earthy phosphates, and especially of the fusible calculus. But when calculi originate from a particular diathesis, there may be many of them lodged in the bladder at the same time. Several distinct nuclei may descend successively from the kidneys, and each may increase in a separate manner. Sometimes, however, calculi in the bladder, which were at first distinct and unconnected, become afterwards cemented together, so as to make only one mass.

The magnitude of calculi in the bladder is generally in an inverse ratio to their number. Some hundreds have been found in one bladder, but they were not larger than a pea. Others of so large a size have been met with, that they were more than six inches in diameter. In Fourcroy's museum, and in that of the Ecole de Médécine at Paris, may be seen some calculi which filled the whole cavity of the bladder; and in the Phil. Trans. for 1809, the late sir James Earle has described an enormous stone, which he extracted after death from the bladder of a gentleman who had been unsuccessfully cut for it. This calculus weighed three pounds four ounces, and was of an oval shape, its long axis measuring sixteen inches. It was of the fusible kind. Their average size may be compared with that of a chesnut, a walnut, or a small hen's egg. Their weight differs from a few grains to upwards of fifty ounces. Common stones of the bladder, however, weigh from two to six ounces. Their weight is

not

not always proportioned to their fize. Subftances of different qualities enter into their compofition, and diverfify their heavinefs. Thus, the falts which have filica for their bafe, and which are very uncommon, render fuch calculi as contain them the heavieft of all in proportion to their fize. On the other hand, fome urinary falts cryftallize when precipitated: of this kind is the ammoniaco-magnefian phofphate, the cryftals of which frequently leave confiderable interfpaces, which are not filled up by the fubfequent precipitations.

The urinary falts, in calculous patients, are not continually precipitated in the fame quantities: in fome cafes, indeed, the procefs appears to be even fufpended for a confiderable time. Hence, a ftone of middling fize, already formed, may increafe but very flowly; and it has actually happened, that a calculus, which could be plainly felt with a found, has remained more than ten years in the bladder, and yet, after all this time, been only of a moderate fize.

According to Dr. Marcet, the form of urinary calculi is moftly fpheroidal, fometimes egg-fhaped, but often flattened on two fides like an almond. P. 50.

Sometimes the calculous matter, which defcends from the kidneys, is in the form of minute fpherical grains, which have a fingular tendency to unite either to each other, or to calculi already lodged in the bladder.

When there are feveral loofe calculi in the bladder together, they feldom lie long in contact with each other, while their fize is diminutive, but are inceffantly changing their fituation as the patient moves about or alters the pofition of his body. Hence, their increafe is at firft regular and uniform; but when they have attained a more confiderable fize, or by their numbers compofe a large mafs, their relative fituation is more permanent, and many of their furfaces, being in this manner ufually covered, no longer receive any additional depofitions. Every other part of thefe calculi, however, goes on increafing. It is thus that ftones with furfaces correfponding to thofe of other ftones are produced, and which are aptly denominated by the French writers "*pierres à facettes*." This fhape neceffarily indicates the prefence of feveral calculi. A different form, however, is by no means a certain criterion of the ftone being fingle.

Calculi alfo occafionally occur which are angular, and fometimes almoft cubic; but, as Dr. Marcet obferves, this is a rare occurrence. The fame phyfician has likewife given the engraving of a fpecies of calculus which fomewhat refembles a pear, with a circular protuberance at its broader end, apparently moulded in the neck of the bladder.

This writer alfo particularly calls our attention to the variety in the colours and furfaces of calculi, which often afford indications of their chemical nature. "When they have a brownifh or fawn colour, fomewhat like mahogany wood, with a fmooth though fometimes tuberculated furface, they almoft always confift of lithic acid. When cut open, they appear to be formed of concentric layers, fometimes homogeneous, fometimes alternating with other fubftances. The colour, however, cannot be confidered as a certain criterion, fince other kinds of calculi may often be coloured in the bladder in a fimilar manner, by bloody mucous or other vitiated fecretions.

"When calculi are white, or greyifh-white, they always confift of earthy phofphates. This is particularly the cafe with the fpecies called fufible. And when they are dark-brown or almoft black, hard in their texture, and covered with tubercles or protuberances, they are generally of the fpecies which has been diftinguifhed by the name of *mulberry*, and confifts of oxalate of lime.

"Calculi have fometimes an uneven cryftalline furface, ftudded with fhining tranfparent particles. This appearance always denotes the prefence of the ammoniaco-magnefian phofphate." Marcet, p. 52.

A large calculus, efpecially when it has a rough irregular furface, produces a great deal of irritation of the bladder, which contracts more clofely round it. The contact, however, is remarked to be particularly exact at the tranfverfe line, which extends between the terminations of the two ureters in the bladder, a part of this organ which generally becomes more thickened than the reft. Sometimes, indeed, the cavity of the bladder is almoft entirely effaced, and the urine can be retained only a very fhort time, or, if it be not evacuated, it fpreads uniformly round the calculus, efpecially above and below the above-defcribed tranfverfe projection, which is lefs yielding than other parts of this organ. Hence, the furface of the ftone, towards the orifices of the ureters, does not enlarge fo faft as the other fides of it, and a circular groove is produced, giving the foreign body the fhape of a calabafh. Such calculi are generally very large, and fometimes even of enormous fize. In the latter circumftance, the foreign body fills the cavity of the bladder fo completely, that there is no fpace left for the lodgment of the urine there, which fluid then generally paffes along a fort of groove, fituated in a line reaching from the lower termination of the ureter to the neck of the bladder. This ftate is of courfe accompanied with a complete incontinence.

Urinary calculi are not always loofe and moveable in the cavity of the bladder, being fometimes fixed in various ways to certain points of the circumference of this organ.

1. When a calculus has reached that part of the lower termination of the ureter, which paffes obliquely between the coats of the bladder, it may obftruct the inferior orifice of the canal, and produce an accumulation of urine above it. The diftention thus arifing may lead to the formation of a cavity betwixt the coats of the bladder, where the calculus is lodged. In fact, calculi have fometimes been found fixed in a cavity of this defcription, the infide of which communicates both with the lower end of the ureter and with the bladder. In fuch a fituation, calculi have alfo been known to attain a confiderable fize.

2. It fometimes happens, that an urinary calculus defcends to the very bottom of the ureter, and one end of it projects fome way into the cavity of the bladder; but the other end cannot difengage itfelf from the tube. If things remain in this ftate long, the confequence is, that the ftone grows larger at its two extremities, while the part which is clofely embraced by the lower termination of the ureter remains much narrower than the reft of the foreign body.

3. Sometimes, in confequence of the diftention of the urine or other caufes, the inner membrane of the bladder protrudes between the fafciculi of its mufcular coat, in the form of pouches or cyfts, which are of different fizes, and occafionally numerous. Small calculi, after getting into thefe cyfts, frequently attain a very large fize; and as the inner coat of the bladder more readily yields than the mufcular fibres admit of feparation, the fundus of fuch pouches becomes capacious, while their orifice remains of a diminutive fize. Hence, a very fmall part of a ftone thus encyfted is naked in the cavity of the bladder, and fometimes the whole of the extraneous body is concealed under a fort of moveable fold of the mucous membrane.

4. There are on record very authentic cafes, proving that calculi, fome of which were of confiderable magnitude, have been fixed and lodged in a cavity that confifted of the upper portion of the bladder, feparated from the reft of this vifcus by a circular contraction. Difficult as it may be to account for fuch facts, the truth of them is unqueftionable.

5. The

5. The tranfverfe projection of the bladder, between the lower terminations of the ureters, is fometimes fo confiderable, as to conftitute a kind of partition, and divide the inferior part of the bladder into two cavities. From this partition, large fungi have fometimes been found projecting, which materially increafed the depth of the two cavities betwixt which it was placed. In thefe cavities, ftones have been obferved, which were of courfe completely feparated.

6. Sometimes calculi in the bladder are found to be adherent to the inner furface of this organ. The irritation of the foreign body having excited ulceration, fungi arife, which grow into the cavities and irregularities obfervable in fome urinary calculi, and thus produce a mechanical fort of adhefion.

When the bladder protrudes from the abdomen, fo as to form hernia, a ftone is occafionally fituated in the difplaced portion of that vifcus. It is a circumftance that has the fame effect as the encyfted ftate of a calculus; for the foreign body is thereby fixed, and it cannot be propelled towards the neck of the bladder at the period when the urine is difcharged. It fhould alfo be known, that in cafes of prolapfus of the uterus, when the bladder is drawn downwards, it has fometimes been found to contain a ftone at the loweft part of it. The poffibility of the complication of a calculus, with fuch difplacements of the bladder, ought to be well remembered, fince, if the nature of the cafe be detected, its treatment becomes materially fimplified.

The fymptoms of a ftone in the bladder have been detailed in the article LITHOTOMY, and we fhall therefore not repeat them in the prefent place. They are all fo equivocal, and bear fo great a refemblance to the effects of feveral other diforders, that they cannot be depended upon, and confequently no furgeon will venture to pronounce pofitively, that there is a calculus in the bladder, unlefs he can feel it with a found. (See SEARCHING.) As for the operation, it is always totally unjuftifiable, if the furgeon cannot plainly feel the calculus immediately before he begins his incifions.

The caufes of the formation of urinary calculi is a fubject which is ftill quite obfcure. The conjectures which have been ftarted refpecting the effect of particular kinds of food, drink, air, &c. do not appear to reft upon a good foundation. We may lay down the following obfervations, however, as tolerably correct.

1. If a foreign body be introduced into a cavity, which is naturally a receptacle for the urine, whatever may be the nature of the immerfed fubftance, it is fure to become incrufted with the urinary falts, without any change however in its compofition. In this cafe, the obfervations of Dr. Marcet tend to prove that the concretion moftly, if not always, confifts of the earthy phofphates, and particularly of the ammoniaco-magnefian phofphate. In this inftance, there is not the leaft reafon for fufpecting the operation of any peculiar diathefis in producing the calculus, fince the prefence of the foreign body, which forms the nucleus for it, would occafion the fame confequence in all defcriptions of patients.

2. There are fome countries where calculi are exceedingly common; others where they are very rare, and yet one cannot explain the difference by any geographical circumftance which is conftant, or by any particularity in the conftitutions of the inhabitants. Calculi are found to be uncommon both in very cold and very hot countries.

3. When the urinary organs are not much injured, patients with ftone may be healthy in every other refpect.

4. Subjects, indeed, gifted with the ftrongeft conftitutions, are liable to urinary calculi, quite independently of the accidental introduction of any foreign body into the urinary organs. In thefe cafes, the origin of the complaint is to be afcribed to a peculiar diathefis, the nature of which is at prefent entirely unknown.

5. Women have been thought to be lefs liable than men to urinary calculi; but yet it is a point which is by no means certain. The queftion, indeed, ftill continues thus: Are women in reality lefs liable than men to urinary calculi? Or do they only fuffer lefs frequently from the diforder in confequence of the facility with which the calculi are generally difcharged through the fhort and capacious canal of the meatus urinarius?

6. Childhood and infancy prefent numerous inftances of urinary calculi; but, according to Delpech, relapfes are feldom obferved at thefe periods of life: that is to fay, an entirely frefh ftone is hardly ever formed again. If a return of the complaint happens, the quicknefs of the recurrence, and an attentive examination of the calculus, will in general fufficiently prove, either that the ftone has formed round a fragment which had not been extracted in the previous operation, or that it was already completely formed at the fame period, but inadvertently left behind.

On the fubject of the frequency of the ftone in children, Dr. Marcet thinks that this is the cafe only among the poor claffes. He remarks, that in the higher ranks, or even in the loweft claffes, provided they are well fed, the fame frequency is not obferved. "In the Foundling Hofpital, for inftance, within the laft twenty-feven years, during which 1151 children have been admitted, only three cafes of ftone have occurred, all of which were among children while at nurfe in the country. And in the Military Afylum at Chelfea, which contains about 1250 children, and into which upwards of 6000 of them have been already admitted, no more than one fingle cafe of ftone has occurred." See Marcet's Effay on Calculous Diforders, p. 36.

7. Youths and adults are not very commonly troubled with calculi, even though they may have been thus afflicted in their infancy or childhood.

8. Old men are much more liable to the diforder, and in them the difpofition to it continues through life. Hence, in fuch patients, relapfes are very frequent. Delpech, Précis Elém. des Mal. Chir. t. ii. p. 195, &c.

Of all the writers who have inveftigated the caufes of urinary calculi, none have interefted us fo much as Dr. Marcet. This able phyfician has endeavoured to eftimate the comparative frequency of the difeafe in various countries, and in the different ftations of life, and to determine whether its frequency be influenced by varieties of climate or fituation, or by peculiarities in our habits and occupations. He inftituted inquiries at all the great hofpitals of the metropolis, in the hope of getting at fome ufeful records concerning the vaft number of patients on whom lithotomy had been performed in thofe eftablifhments. In London, he found it impoffible to obtain all the particulars of fuch cafes, as no entry of them was preferved. The Norwich hofpital, however, afforded him fome details, which are interefting. All the calculi, which have been extracted in that hofpital for the laft forty-four years, and which amount to 506, have been carefully preferved, with the circumftances annexed to each ftone, and the event of the operation diftinctly recorded. Dr. Marcet has given the refults of thefe records in the following table:

Returns of the cafes of lithotomy in the Norfolk and Norwich hofpital, from 1772 to 1816, making a period of forty-four years :

	Number of Operations.			Deaths.		
	Children under 14.	Adults.	Total.	Children.	Adults.	Total.
Males	227	251	478	12	56	68
Females	8	20	28	1	1	2
	235	271	506	13	57	70

It appears, fays Dr. Marcet, from the above table, that the mean annual number of cafes of lithotomy in the Norwich hofpital, during the laft forty-four years, has been 11½ or 23 in every two years; and that the total number of fatal cafes in the 506 operations, is 70, or 1 in 7¼, or 4 in 29. It appears alfo, that the proportion of females who have undergone the operation is to that of males, as 58 to 1000, or about 1 to 17; that the mortality from the operation in children was only about 1 in 18; while, in adults, it was 4 in 19, or nearly quadruple.

From the year 1772 to 1816, the Norwich hofpital has received 18,859 patients of all kinds, making an average of 428 annual admiffions; and Dr. Marcet obferves, that the proportion of 506 operations of lithotomy, out of 18,859 patients, which correfponds to about 1 in 38, exceeds, in an aftonifhing degree, that obtained from any of the other public inftitutions, whofe records he examined.

Next to the records of the Norwich hofpital, Dr. Marcet derived the moft diftinct information of this kind from Chefelden, who mentions in his work on anatomy, that, during the courfe of his public practice in St. Thomas's hofpital, a period of about twenty years, he had performed the operation of the ftone 213 times, and loft only 20 patients. This was about 2 cafes in 21, which is much lefs than the common average.

In St. Thomas's hofpital, during the laft ten years, the operation of lithotomy feems to have been done, on an average, 11 times in each two years; and 1 cafe of ftone has occurred in each 528 patients admitted.

In St. Bartholomew's, lithotomy was performed 56 times in the years 1812, 1813, 1814, 1815, and 1816. The annual average about 11, or 1 in each 340 patients of all defcriptions.

In Guy's hofpital, Dr. Marcet has reafon to believe that lithotomy has been performed, on an average, about 9 or 10 times annually, during the laft 20 or 30 years. The proportion of calculous patients there is alfo eftimated at 1 in about 300 cafes of all kinds.

Dr. Marcet's inquiries incline him to think, that, on the whole, the occurrence of lithotomy in the London hofpitals has for fome years been gradually diminifhing; and this he conceives may be owing partly to a real reduction in the frequency of the ftone, from fome alteration in the diet or habits of the people; partly to the ufe of appropriate medicines; and partly to the circumftance of calculous patients not reforting fo exclufively, as was formerly the cafe, to the great London hofpitals for the operation.

In the Royal Infirmary at Edinburgh, the average number of ftone cafes annually, during the laft fix years, is faid not to have exceeded two, although about 2000 patients are admitted there every year.

Dr. Marcet has been informed by M. Roux, that in La Charité, at Paris, ten or twelve cafes of ftone occur every year out of about 2600 patients; and that the proportion of deaths from the operation there is 1 in 5 or 6.

In the Hôpital des Enfans Malades, in the fame city, Dr. Marcet ftates, on the authority of Dr. Biett, that about fix cafes of ftone are received every year into that eftablifhment, where about 3000 children of both fexes are annually admitted. There have been only three cafes in females, and, what is remarkable, only two deaths from the operation, in the courfe of the laft feven years.

Dr. Marcet has been acquainted, that at Vienna lithotomy is comparatively rare, not on account of the want of good furgeons, or the unfrequent occurrence of ftone cafes in that part of the continent, but in confequence of the little attention paid to this difeafe by the moft eminent furgeons of the Auftrian capital. It is certainly no credit to thefe practitioners, to find them encouraging Pajola's plan of operating, which is a revival of one form of that barbarous method, the apparatus major. The fuccefs which this lithotomift is faid to have had is almoft incredible, when his way of operating is confidered; for he is ftated to have performed the operation 550 times with fuccefs.

At Geneva, fays Dr. Marcet, in a population of 30,000 fouls, lithotomy, including both public and private practice, has been performed only thirteen times in the laft twenty years, though good furgeons are never wanting in that town to perform the operation, when an opportunity occurs. Out of thefe thirteen patients, feven were not ftrictly Genevefe, though belonging to the neighbouring diftricts, and one was an Englifhman; fo that the difeafe would, at firft fight, appear to be a rare occurrence at Geneva. But, continues Dr. Marcet, if the fmallnefs of the Genevefe population be taken into account, this proportion of calculous cafes may not fall very fhort of that obferved in other places. At Lyons, a populous town, which is not more than 80 miles diftant from Geneva, the difeafe is ftated to be rather frequent.

In tropical climates, urinary calculi are almoft unknown; and, as Dr. Marcet obferves, we have, in confirmation of this fingular and important fact, the recent ftatement of Dr. Scott, who, from his long refidence in India, and his well-known habits of obfervation, may be confidered as one of the beft authorities. Dr. Scott indeed affirms, that, between the tropics, he never met with a fingle inftance of the formation of a ftone in the urinary bladder, although he knew of fome cafes which had been imported, and which were not cured by climate. See Marcet's Effay on the Chemical Hiftory and Medical Treatment of Calculous Diforders, chap. 2. London, 1817.

Urinary calculi are faid alfo to be very uncommon in Spain and Africa. If, however, it be an undoubted fact, that the diforder is rare in hot climates, ftill it is impoffible to offer any rational theory of the circumftance, becaufe the difeafe is likewife unufual in very cold countries, fuch as Sweden. See Richerand's Nofographie Chir. tom. iii. p. 528. edit. 4.

With regard to the chemical nature of urinary calculi, there was nothing known until as late a period as 1776, when the celebrated Swedifh chemift, Scheele, publifhed a paper on the fubject, in the Stockholm Tranfactions. In this effay, he ftated, that all the urinary calculi which he had examined, confifted of a peculiar concrete fubftance, now well known by the name of the *lithic* or *uric* acid, which he alfo fhewed was foluble in alkaline lixivia. Scheele further difcovered, that the lithic matter was in fome degree capable

capable of being diffolved in cold water; that this folution poffeffed acid properties, and, in particular, that of reddening litmus; that it was acted upon in a peculiar manner, when boiled in nitric acid; and, laftly, that human urine always contained this fubftance in greater or lefs quantity, and often let it feparate in the form of a brick-coloured fediment, by the mere effect of cooling.

The difcovery made by Scheele was confirmed by Bergmann and Morveau, and the inveftigation of the fubject was afterwards profecuted by others with redoubled ardour. As profeffor Murray obferves, experiments continued to be repeated and diverfified on thefe concretions, and on their folvents. At length, it was fully afcertained, that there exifted others, befides thofe compofed of uric acid; and, latterly, our knowledge of them has been much extended by the refearches of Pearfon, Wollafton, Fourcroy, and Vauquelin. Several important facts have alfo been eftablifhed by the talents and induftry of fome other diftinguifhed men; *viz.* Dr. Henry of Manchefter, profeffor Brande of the Royal Inftitution of London, and Dr. Marcet of Guy's hofpital.

The credit which is due to Dr. Wollafton, for his valuable and original difcoveries refpecting urinary calculi, is very confiderable; a truth which we have particular pleafure in recording here, fince his merits have not been fairly appreciated by the French chemifts. Indeed, as Dr. Marcet obferves, it is the more defirable that his claims fhould be placed in the cleareft point of view, as the late celebrated M. Fourcroy, both in his "Syftéme des Connoiffances Chimiques," and in his various papers on this particular fubject, has, in a moft unaccountable manner, overlooked Dr. Wollafton's labours; and in defcribing refults, exactly fimilar to thofe previoufly obtained and publifhed by the Englifh chemift, has claimed them as his own difcoveries. Yet Dr. Wollafton's paper was printed in our Philofophical Tranfactions two years before Fourcroy publifhed his memoir in the "Annales de Chimie," and three years before he gave to the world his "Syftéme des Connoiffances Chimiques;" and he difcuffed in thefe works a paper of Dr. Pearfon on the lithic acid, publifhed in a volume of the Philofophical Tranfactions for 1798, fubfequent to that which contained the account of Dr. Wollafton's difcoveries. Effay on Calculous Diforders, p. 60; alfo Murray's Syft. of Chem. vol. iv. p. 636. edit. of 1809.

From what has been ftated, it appears, then, that Scheele firft difcovered the nature of thofe urinary calculi which confift of lithic acid; but that Dr. Wollafton firft afcertained the nature of feveral other kinds, fome of which have alfo been defcribed at a later period by Fourcroy and Vauquelin. On the whole, there are five fpecies of concretions, whofe chemical properties were firft pointed out by Dr. Wollafton, and no lefs than four belong to the urinary organs. Thefe are, 1ft, Gouty concretions; 2dly, The fufible calculus; 3dly, The mulberry calculus; 4thly, The calculus of the proftate gland; 5thly, The cyftic oxyd, which laft was difcovered in 1810.

Dr. Marcet, in his late ingenious effay, arranges urinary calculi under the following heads:

1. The lithic calculus.
2. The bone-earth calculus, principally confifting of phofphate of lime.
3. The ammoniaco-magnefian phofphate, or calculus in which this triple falt obvioufly prevails.
4. The fufible calculus, confifting of a mixture of the two former.
5. The mulberry calculus, or that compofed of oxalate of lime.
6. The cyftic calculus, confifting of the fubftance called by Dr. Wollafton cyftic oxyd.
7. The alternating calculus, or concretion compofed of two or more different fpecies, arranged in alternate layers.
8. The compound calculus, the ingredients of which are fo intimately mixed, as not to be feparable without chemical analyfis.
9. Calculus of the proftate gland.

Dr. Marcet likewife defcribes two other fpecimens, which are not referrible to any of the foregoing fpecies.

1. *Lithic or Uric Acid Calculus.*—The lithic acid forms a hard, inodorous concretion, of a yellowifh or brown colour, fimilar to that of wood, of various fhades. According to profeffor Murray, calculi of this kind are in fine, clofe layers, fibrous, or radiated, and generally fmooth on their furface, though fometimes a little rough. They are rather brittle, and have a fpecific gravity, varying from 1.276 to 1.786, but ufually above 1.500. One part of lithic acid is faid to diffolve in 1720 parts of cold water, and 1150 parts of boiling water (Marcet, p. 65.); and this folution turns vegetable blues to a red colour. When it has been diffolved in boiling water, fmall yellowifh cryftals are depofited as the fluid becomes cold. Lithic acid calculi blacken, but are not melted by the blow-pipe, emitting a peculiar animal fmell, and gradually evaporating, until a fmall quantity of white afh remains, which is alkaline. By diftillation, they yield ammonia and pruffic acid. They are foluble, in the cold, in a folution of pure potaffa, or foda; and from the folution, a precipitate of a fine white powder is thrown down by the acids. Lime-water likewife diffolves them, but more fparingly. In folutions of the alkaline carbonates, they remain, according to Scheele, unchanged: according to the experiments of Dr. Egan, however, they are diffolved even by a weak folution, and alfo when the acid is fuperfaturated by carbonic acid. (Tranf. of Irifh Acad. 1805.) They are not much acted upon by ammonia. They are not foluble either in the muriatic or fulphuric acid; though they are fo in the nitric, when affifted by heat; and the refidue of this folution, when evaporated to drynefs, affumes a remarkably bright pink colour, which difappears on adding either an acid or an alkali. In many of thefe calculi, the lithic acid is nearly pure; in others, there is an intermixture of other ingredients, particularly of phofphate of lime, and phofphate of ammonia and magnefia; and, in almoft all of them, there is a portion of animal matter, which occafions the fmell, when they are burnt, and the lofs in their analyfis. See Murray's Chemiftry, vol. iv. p. 640; and Marcet's Effay on the Chem. and Med. Hift. of Calculous Diforders.

2. *Bone-earth, or Phofphate of Lime Calculus.*—The exiftence of phofphate of lime in urinary calculi had been mentioned by Bergmann and others, when Dr. Wollafton firft afcertained that fome calculi are entirely compofed of it, forming a diftinct fpecies of thefe concretions. From the obfervations of the laft mentioned eminent chemift, it appears that this fubftance fometimes compofes the entire calculus; though, in more common inftances, it is mixed with other ingredients, particularly with uric acid, and with phofphate of magnefia and ammonia. In the firft cafe, the calculus is defcribed as being of a pale brown colour, and fo fmooth as to appear polifhed. When fawn through, it is found very regularly laminated, and the laminæ, in general, adhere fo flightly to each other, as to feparate with eafe into concentric crufts. It diffolves entirely, though flowly, in muriatic or nitric acid. Expofed to the flame of the blow-pipe, it is at firft flightly charred, but foon becomes perfectly white, retaining its form, until urged with the ut-

most heat rom a common blow-pipe, when it may be completely fused. It appears to be more fusible than the phosphate of lime, which forms the basis of bone; a circumstance which Dr. Wollaston ascribes to the latter containing a larger quantity of lime. (Phil. Trans. 1797.) Calculi, altogether composed of phosphate of lime, are rather uncommon: with this substance there are usually other ingredients, especially the phosphates of magnesia and ammonia, and lithic acid.

3. *Triple Calculus, or Ammoniaco-magnesian Phosphate.*—The existence of this calculus in the intestines of animals was first pointed out by Fourcroy; but its being a constituent part of some urinary calculi of the human subject was originally ascertained by Dr. Wollaston. (Phil. Trans. 1797.) Calculous masses, consisting solely of this substance, are perhaps never met with; but concretions often occur, in which it obviously prevails; and, as Dr. Marcet observes, "this triple salt frequently appears also in the form of minute sparkling crystals, diffused over the surface, or between the intestines of other calculous laminæ. Calculi, in which this triple salt prevails, are generally whiter and less compact than those of the former class. When the blow-pipe is applied, an ammoniacal smell is perceived, the fragment diminishes in size; and if the heat be strongly urged, it ultimately undergoes an imperfect fusion, being reduced to the state of phosphate of magnesia." (P. 69.) Dr. Wollaston describes the form of the crystals of this salt, as being a short trilateral prism, having one angle a right angle, and the other two equal, terminated by a pyramid of three or six sides. These crystals, as Dr. Marcet has explained, are but very sparingly soluble in water, but very readily in most, if not all, the acids; and on precipitation, they reassume the crystalline form. From the solutions of these crystals in muriatic acid, sal ammoniac may be obtained by sublimation. Solutions of caustic alkalies disengage ammonia from the triple salt, the alkali combining with a portion of the phosphoric acid.

4. *The fusible Calculus.*—Mr. Tennant first discovered that this substance was different from the lithic acid, and that, when urged by the blow-pipe, instead of being nearly consumed, a large part of it melted into a white vitreous globule. The nature of the fusible calculus was afterwards more fully investigated and explained by Dr. Wollaston. (Phil. Trans. 1797.) According to the excellent description lately given of this calculus by Dr. Marcet, it is commonly whiter and more friable than any other species. It sometimes resembles a mass of chalk, leaving a white dust on the fingers, and separates easily into layers or laminæ, the interstices of which are often studded with sparkling crystals of the triple phosphate. At other times, it appears in the form of a spongy and very friable whitish mass, in which the laminated structure is not obvious. Calculi of this kind often acquire a very large size, and they are apt to mould themselves in the contracted cavity of the bladder, assuming a peculiarity of form, which Dr. Marcet has never observed in any of the other species of calculi, and which consists in the stone terminating, at its broader end, in a kind of peduncle, corresponding to the neck of the bladder. The chemical composition of the fusible calculus is a mixture of the triple phosphate and phosphate of lime. These two salts, which, when separate, are infusible, or nearly so, when mixed together and urged by the blow-pipe, easily run into a vitreous globule. The composition of this substance, says Dr. Marcet, may be shewn in various ways. Thus, if it be pulverized, and acetic acid poured upon it, the triple crystals will be readily dissolved, while the phosphate of lime will scarcely be acted upon; after which the muriatic acid will readily dissolve the latter phosphate, leaving a small residue, consisting of lithic acid, a portion of which is always found mixed with the fusible calculus.

It is an observation made by the same interesting writer, that many of the calculi which form round extraneous bodies in the bladder, are of the fusible kind. The same thing is remarked with respect to the calculous matter sometimes deposited between the prepuce and glans. For many other particulars, respecting the fusible calculus, we refer to Dr. Marcet's Essay and Dr. Wollaston's paper in the Phil. Trans.

5. *Mulberry Calculus, or Oxalate of Lime.*—This is mostly of a dark brown colour, and frequently its interior is grey. Its surface is usually uneven, presenting tubercles more or less prominent, frequently rounded, sometimes pointed, and either rough or polished. It is very hard, difficult to saw, and appears to consist of successive unequal layers. Excepting the few stones which contain a proportion of silica, it is the heaviest of the urinary concretions. Though this calculus has been named *mulberry*, from its resemblance to that fruit, yet, as Dr. Marcet has observed, there are many concretions of this class which, far from having the mulberry appearance, are remarkably smooth and pale-coloured, as may be seen in plate 8, fig. 6. of that gentleman's essay.

According to Mr. Brande, persons who have voided this species of calculus, are much less liable to a return of the complaint, than other patients who discharge lithic calculi. Phil. Trans. 1808.

With regard to chemical characters (says professor Murray), it is less affected by the application of the usual reagents than any other calculus. The pure alkaline solutions have no effect upon it, and the acids dissolve it with great difficulty. When it is reduced, however, to fine powder, both muriatic and nitric acid dissolve it slowly. The solutions of the alkaline carbonates decompose it, as Fourcroy and Vauquelin have observed; and this affords us the easiest method of analysing it. The calculus in powder being digested in the solution, carbonate of lime is soon formed, which remains insoluble, and is easily distinguished by the effervescence produced by the addition of weak acetic acid, while there is obtained in solution the compound of oxalic acid with the alkali of the alkaline carbonate. From this, the oxalic acid may be precipitated by the acetate of lead, or of barytes; and this oxalate, thus formed, may be afterwards decomposed by sulphuric acid. Another method of analysing this calculus is by exposure to heat: its acid is decomposed, and by raising the heat sufficiently, pure lime is obtained, amounting to about a third of the weight of the calculus. According to Fourcroy and Vauquelin, the oxalate of lime calculus contains more animal matter than any other. This animal matter appeared to them to be a mixture of albumen and urée. The composition of a calculus of this species, analysed by Mr. Brande, was oxalate of lime 65 grains, uric acid 16 grains, phosphate of lime 15 grains, animal matter 4 grains.

6. *The Cystic Oxyd* was first described by Dr. Wollaston in the Phil. Trans. for 1810. In external appearance, it bears a greater resemblance to the triple phosphate of magnesia, than any other sort of calculus. It is however more compact, and does not consist of distinct laminæ, but appears as one mass confusedly crystallized throughout its substance. It has a yellowish semi-transparency, and a peculiar glistening lustre. Under the blow-pipe, it gives a singularly fetid smell, quite distinct from that of lithic acid, or the smell of prussic acid. Distilled in close vessels, it yields fetid carbonate of ammonia, partly fluid and partly solid, and a heavy fetid oil; and there remains a black spongy coal, which

which is much ſmaller than that left by lithic acid. Water, alcohol, acetic, tartaric, and citric acids, and ſaturated carbonate of ammonia, can only diſſolve a very ſlight proportion of it. The ſolvents of it, on the other hand, are numerous; as, for inſtance, the muriatic, nitric, ſulphuric, phoſphoric, and oxalic acids; potaſh, ſoda, ammonia, and lime-water, and even the neutral carbonates of potaſh and ſoda. When, therefore, it is intended to ſeparate it from acids, the neutral carbonate of ammonia is beſt adapted to the purpoſe, as it is not capable of rediſſolving the precipitate even when added in exceſs; and, for the ſame reaſon, the acetic and citric acids are beſt ſuited to precipitate it from alkalies.

In conſequence of the diſpoſition of this ſpecies of calculus to unite both with acids and alkalies, in common with other oxyds, and the fact of its alſo containing oxygen, (as is proved by the formation of carbonic acid in diſtillation,) Dr. Wollaſton named it an oxyd, and the term *cyſtic* was added from its having been originally found only in the bladder in two examples. Dr. Marcet, however, has ſubſequently met with no leſs than three inſtances of calculi formed of cyſtic oxyd, all of which were unqueſtionably of *renal* origin.

7. *Compound Calculi in diſtinct Layers.*—Lithic ſtrata frequently alternate with layers of oxalate of lime, or with the phoſphates. Sometimes alſo the mulberry alternates with the phoſphates, and, in a few inſtances, three or even four ſpecies of calculi occur in the ſame ſtone diſpoſed in diſtinct concentric laminæ. For ſpecimens of theſe facts, we refer to Dr. Marcet's intereſting eſſay, in which varieties of ſuch calculi are correctly delineated and coloured.

8. *Compound Calculi with their Ingredients intimately mixed.*—Under this title, Dr. Marcet comprehends certain calculi, which have no characteriſtic feature, by which they can be conſidered as diſtinctly belonging to any of the other claſſes. He obſerves, that they may ſometimes be recognized by their more or leſs irregular figure, and their leſs determined colour, by their being leſs diſtinctly if at all ſtratified, and by their often poſſeſſing a conſiderable hardneſs. By chemical analyſis confuſed reſults are obtained. See Marcet's Eſſay on the Chem. and Med. Hiſt. of Calc. Diſorders, p. 90.

9. *Calculi of the Proſtate Gland.*—The compoſition of theſe calculi is ſaid to have been firſt explained by Dr. Wollaſton. (See Phil. Tranſ. for 1797.) They all conſiſt of phoſphate of lime, the earth not being redundant as in bones. Their ſize varies from that of a pin's head to that of a hazel-nut. Their form is more or leſs ſpheroidal, and they are of a yellowiſh-brown colour.

Fourcroy has deſcribed a ſpecies of urinary calculus, which is characterized by its being compoſed of the urate of ammonia. Dr. Wollaſton, Mr. Brande, and Dr. Marcet have not, however, ſatisfactorily aſcertained the preſence of this ſubſtance in any of the concretions which they have examined. It is alſo to be recollected, that urea and the triple phoſphate, both of which afford ammonia, are frequently preſent in lithic calculi, and they may have given riſe to the analytical reſults from which the exiſtence of urate of ammonia has been inferred. Brande in Phil. Tranſ. 1808. Marcet's Eſſay, p. 93.

Dr. Marcet has met with two ſpecimens of urinary calculi entirely different from any which have hitherto been noticed. One of theſe he propoſes to name *xanthic oxyd*, from ξανθος, *yellow*, becauſe one of its moſt characteriſtic properties is that of forming a lemon-coloured compound, when acted upon by nitric acid. The chemical properties of the other new calculus, mentioned by Dr. Marcet, correſpond to thoſe of fibrine, and he therefore ſuggeſts the propriety of diſtinguiſhing it by the term *fibrinous*. For a particular deſcription of theſe new ſubſtances, we refer to this gentleman's eſſay.

In addition to the remarks which have been offered in the article LITHOTOMY, on the ſubject of lithontriptic medicines, we mean to ſay very little in the preſent place. Whoever ſtudies the chemical properties of the urine will learn, that "if any alkali (a few drops of ammonia for inſtance) be added to recent urine, a white cloud appears, and a ſediment, conſiſting of phoſphate of lime, with ſome ammoniaco-magneſian phoſphate, ſubſides, in the proportion of about two grains of the precipitate from four ounces of urine. Lime-water produces a precipitate of a ſimilar kind, which is ſtill more copious; for the lime, in combining with the exceſs of phoſphoric, and perhaps alſo of lactic acid, not only precipitates the phoſphate of lime which theſe acids held in ſolution, but it decompoſes the other phoſphates, thus generating an additional quantity of the phoſphate of lime, which is alſo depoſited.

"If, on the contrary (ſays Dr. Marcet), a ſmall quantity of any acid, either the phoſphoric, the muriatic, or, indeed, even common vinegar, be added to recent healthy urine, and the mixture be allowed to ſtand for one or two days, ſmall reddiſh cryſtalline particles of lithic acid will be gradually depoſited on the inner ſurface of the veſſel.

"It is on theſe two general facts, that our principles of chemical treatment ultimately reſt. Whenever the lithic ſecretion predominates, the alkalies are the appropriate remedies, and the acids, particularly the muriatic, are the agents to be reſorted to, when the calcareous or magneſian ſalts prevail in the depoſit." P. 147, 148.

It is a fact perfectly well aſcertained, that the alkalies taken into the ſtomach reach the urinary paſſages through the medium of the circulation; and it is alſo ſtrongly ſuſpected, that the acids likewiſe do ſo, though this circumſtance may not be ſo well proved. Unfortunately, the quantity of either alkalies or acids, which thus mixes with the urine, is ſo ſmall, that no impreſſion is made upon calculi of magnitude. The experience of Dr. Marcet and others, however, has clearly aſcertained that ſuch medicines are often capable of checking a tendency to the formation of ſtone, and ſometimes of bringing on a calculous depoſit depending upon the altered ſtate of the ſyſtem. This writer, indeed, expreſſes his decided opinion, that even ſuppoſing not an atom of alkali or acid ever reached the bladder, ſtill it would not be unreaſonable to expect that theſe remedies may reſpectively produce the deſired changes during the firſt ſtages of aſſimilation, in one caſe by neutralizing any morbid exceſs of acid in the primæ viæ, and in the other by checking a tendency to alkaleſcence, or otherwiſe diſturbing thoſe affinities which, in the ſubſequent proceſſes of aſſimilation and ſecretion, give riſe to calculous affections. P. 153.

When muriatic acid is preſcribed, from five to twenty-five drops may be given two or three times a day, diluted with a ſufficient quantity of water.

The beſt way of taking the alkalies is by drinking ſoda-water as a common beverage. It is aſſerted, however, on the authority of ſir G. Blane, that when the alkalies are combined with citric acid, as in the ordinary ſaline draught, they alſo have the effect of depriving the urine of its acid properties.

Dr. Marcet, with every appearance of probability, refers to carbonic acid itſelf no ſolvent power, and he does not even adopt Mr. Brande's opinion, that this acid paſſes into the urine, when patients drink fluids which are impregnated with it.

Sir

Sir E. Home and Mr. Hatchett first suggested the utility of giving magnesia in cases of stone, and the proposal was communicated to the public by Mr. Brande. (Phil. Trans. 1810.) It is, as Dr. Marcet observes, often found advantageous in long protracted cases, in which the constant use of the subcarbonated or caustic alkalies would injure the stomach. But, he properly remarks, that if magnesia is sometimes beneficial, it has of late years often done harm. For, as this earth is the base of one of the most common species of calculi, the ammoniaco-magnesian phosphate, there is nearly an even chance, when magnesia is prescribed, without any previous knowledge of the nature of the calculus, that it will prove injurious. Magnesia also, when obstinately administered, sometimes forms large masses in the intestinal canal, causing serious distress, and even fatal consequences.

According to Dr. Prout, purgatives will sometimes stop calculous depositions, especially in children; and Dr. Henry, of Manchester, has observed, that a quack medicine, composed of turpentine and opium, will occasionally produce a plentiful discharge of lithic acid from the bladder.

For many of the foregoing observations, we are indebted to Dr. Marcet's interesting Essay on the Chemical and Medical Treatment of Calculous Disorders, London, 1817. Some other remarks on injections, as a means of dissolving calculi in the bladder, and on lithontriptics in general, will be found in the article Lithotomy.

Urinary *Fistulæ*. See Fistulæ *in Perinæo*, and Urinary *Abscesses*.

Urinary *Passage*. See Urethra.

URINE, in *Physiology*, the fluid secreted by the kidney. See Kidney.

Urine, *Bloody*. See Hæmaturia.

Urine, *Incontinence of*. An incontinence of urine is when this fluid comes away from the patient involuntarily, without his having any power of retaining it. The disorder is one to which children are particularly liable; adults are less frequently afflicted with it; and it is a case which seldom occurs in persons of very advanced years. The latter assertion, as Desault remarks, must appear erroneous to those who frequently meet with old persons unable to retain their urine, were it not well ascertained, that patients often mistake for an incontinence of urine the overflowing of this fluid out of the urethra, in cases of retention, of which that occurrence is only a symptom. There are even some surgeons, says Desault, who imbibe this popular error, and seem unaware that an involuntary discharge of urine may exist together with a retention, and be the effect of it, as is generally the case in such retentions as depend upon weakness and paralysis of the bladder. In these instances, the distended fibres of this viscus react upon the urine which then issues from the urethra, until the resistance of the sphincter and of the canal is in equilibrium with the expelling power. Sometimes the urine even dribbles away incessantly, which happens whenever the action of the bladder has been completely destroyed; for, in this state, this viscus being constantly full, cannot receive any more of the urine that is brought to it by the ureters, unless an equal quantity at the same time escape through the urethra. This is a case which will more properly fall under consideration in the article Urine, *Retention of*, and we need not therefore dwell upon it at present.

The causes of an incontinence of urine, properly so called, are diametrically different from those of a retention. The latter case happens whenever the bladder becomes weak, and the resistance in the urethra increased. An incontinence, on the other hand, arises either from the expelling power of the bladder being augmented, while the resistance in the urethra is not proportionably increased; or from the resistance being lessened, while the expelling force remains unchanged. According to these principles, it is easy to explain why the disorder should be most common in children. At this age, it is well known that there is more irritability than at any other period of life. It is also well known that the expulsion of the urine is entirely effected by muscular action, while the resistance is merely owing to the sphincter vesicæ, the levatores ani, and perhaps to a few other inconsiderable fasciculi of muscular fibres; for the different curvatures of the urethra, and the contractile power of this tube itself, can make but a passive and feeble resistance to the issue of the urine. An incontinence happens in children, because the bladder contracts so suddenly and forcibly, that its contents are voided almost before these young subjects are aware of any desire to make water, and without their being able to restrain the evacuation. There are also many children who, from indolence or carelessness, do not make water immediately the first calls of nature incite them, and who afterwards, being urgently pressed, wet their clothes. In other young subjects, the sensation which makes the bladder contract, and accompanies the expulsion of the urine, is so slight, that the function is performed without any formal act of the will, without even exciting an impression sufficiently strong to disturb sleep. This is the case with such children as are troubled only with an incontinence of urine in the night-time. Increasing years, by diminishing the irritability of the bladder, and making man more attentive to his necessities, usually bring about a cure of the infirmity, which seldom continues till the patient has attained the adult state.

It must not be supposed, however, that no period of life excepting childhood can be afflicted with the complaint. Other ages are also liable; but then the disorder almost always depends upon a defect of resistance to the issue of the urine, and it may be occasioned by weakness, or paralysis of the sphincter vesicæ, or levatores ani: sometimes, also, by a forcible dilatation of the urethra, and loss of its elasticity. Frequently all these causes are at the same time concerned.

A calculus, a fungus, or any other extraneous body of an irregular shape, may be fixed in the neck of the bladder, and not accurately filling it, may allow the urine to escape at the sides; or the foreign body may even form sorts of channels, through which the fluid passes.

Frequently, also, a violent contusion or forcible distention of the sphincter is followed by an incontinence of urine. The complaint used to be very common formerly after the mode of lithotomy called the apparatus major; and it is even at present not an unusual consequence of the extraction of calculi from females by the dilatation of the meatus urinarius. (See Lithotomy.) The neck of the bladder and the urethra are forcibly distended in these operations, and, consequently, they lose their contractile power, continue dilated, and no longer duly oppose the escape of the urine.

Women who have had difficult labours, and in whom the child's head, by compressing the neck of the bladder, has seriously contused and weakened this part, are also subject to a species of incontinence of urine; which, however, is in general only experienced when they laugh, or make any considerable exertion.

Most authors, who have treated of incontinence of urine, have related, that persons afflicted with palsy and apoplexy are very liable to the complaint. But, as we have already explained, they have here mistaken what the French surgeons aptly call the "retention d'urine avec regorgement," for an incontinence. In this sort of case, the same writers have attributed the involuntary discharge of the urine to paralysis

of the ſphincter of the bladder; but they have not remembered that the bladder itſelf alſo participates in the paralytic affection; for the ſphincter not being a particular muſcle, but only a faſciculus of fleſhy fibres, formed, as Deſault obſerves, by the junction of thoſe which compoſe the inner layer of the muſcular coat of the bladder, it can only be weakened in the ſame degree, and at the ſame time, as the reſt of this organ. Beſides, ſays Deſault, we have proved, and all phyſiologiſts admit the fact, that the action of the bladder is abſolutely neceſſary for the expulſion of the urine, and that an inert condition of this viſcus is always followed by a retention.

An incontinence of urine is not attended with ſo much danger as a retention. It is, however, a moſt afflicting infirmity to a perſon obliged to mix with ſociety: his clothes being continually wet with urine, the ſtench which he carries about with him is equally an annoyance to himſelf, and every body elſe who approaches him.

An incontinence of urine in children uſually gets well of itſelf as they grow up. When they wet their beds really from idleneſs and careleſſneſs, moderate chaſtiſement may be proper, inaſmuch as the fear of correction will make them pay more attention to the earlieſt ſenſations of the deſire to make water. We fear, however, that this doctrine is carried to rather an unjuſtifiable extent, particularly in ſchools; and, at all events, puniſhment in ſuch caſes ſhould never be ſevere, as, in ninety caſes out of a hundred, the diſorder is a true infirmity, ariſing from the cauſes already indicated, and not from indolence; the ſuppoſed crime taking place, in fact, when the child is aſleep, and unconſcious of what is happening.

When an incontinence of urine depends upon an exceſſive irritability, in which ſtate the bladder is forced to contract by a very ſmall quantity of urine in it, and involuntarily overcome the reſiſtance of the urethra, an endeavour ſhould be made to leſſen ſuch irritability by the uſe of the warm or cold bath, ſea-bathing, mucilaginous drinks, &c. If the accident ſhould happen only in the night-time, the child ſhould not take any drink for ſome time before being put to bed; ſhould empty the bladder before going to ſleep; and, if neceſſary, be taken up in the night to do the ſame thing again.

When the incontinence depends on a want of action in the parts producing the reſiſtance in the urethra, tonics may be externally and internally employed. They ſeldom ſucceed, however, when the diſorder is of long ſtanding. In this circumſtance, palliative means muſt be reſorted to; *viz.* inſtruments calculated to compreſs the urethra, and intercept the paſſage of the urine. This object is more difficult to accompliſh in women than men; but it may be done by means of an inſtrument which conſiſts of an elaſtic hoop, which goes round the pelvis, and from the middle of which, in front, a curved elaſtic piece of ſteel deſcends, and terminates in a ſmall compreſs, which is contrived to cover accurately the orifice of the meatus urinarius. See Œuvres Chir. de Deſault, par Bichat, t. iii. p. 95, &c.

The application of bliſters to the ſacrum has often proved very effectual in curing incontinence of urine, both when the complaint ſeemingly aroſe from exceſſive irritability of the bladder, or from paralyſis and loſs of tone in this organ, and the parts which naturally reſiſt the expulſion of the urine from it. The reader will find ſome very intereſting caſes of this kind in the Medical Obſervations and Inquiries.

Urine, *Retention of.* When, from any particular cauſe, the urine cannot be diſcharged from the bladder through the urethra, it accumulates in that receptacle, which it gradually diſtends ſometimes even to an incredible magnitude. The diſeaſe has been deſcribed by the ancients under the generic name of *iſchuria*. Certain writers make a diſtinction between this diſorder and other caſes, to which they apply the terms *dyſury* and *ſtrangury*; while others have conſidered theſe laſt only as different kinds of retention of urine. Some ſurgeons always mean by *dyſury* the caſe in which the urine is diſcharged with great pain and difficulty; and by the word *ſtrangury*, the example in which the evacuation can be made only by drops; while they reſtrict *iſchuria* to the form of the diſeaſe in which no urine at all can be voided. Deſault very juſtly imputed this variety in the ſymptoms to different degrees of the ſame diſeaſe, and he therefore, with much propriety, preferred the diviſion into the *complete* and *incomplete retentions of urine*.

As Mr. Hey has obſerved, the diſtinction which has ſometimes been made between a *ſuppreſſion* and *retention* of urine, is practical and judicious. The former moſt properly points out a defect in the ſecretion of the kidneys; the latter an inability of expelling the urine when ſecreted. We alſo like the following ſimple and plain definition: "The diſeaſe (ſays he), of which I am ſpeaking, under the term *retention of urine*, is an inability, whether total or partial, of expelling by natural efforts the urine contained in the bladder." Pract. Obſ. in Surgery, p. 389. edit. 2.

When the urine is retained in the bladder, the parietes of this organ ſuffer from diſtention, and after the tone of its muſcular fibres has been ſtrained, it can make only a feeble reſiſtance to its further dilatation, and ſometimes it becomes of conſiderable ſize. In an infant a year and a half old, it has been known to contain a pint of urine; and in adults, ſix or ſeven pints. The bladder, thus diſtended, has been found to fill not only the cavity of the pelvis, but to riſe up into the abdomen higher than the navel. It has ſometimes been obſerved to extend itſelf even through the abdominal rings, ſo as to conſtitute a ſcrotal rupture; or under the crural arch into the groin. Such elongations of the bladder, it is true, are not very common; yet many inſtances of them are recorded in the Memoirs of the French Academy of Surgery. In ordinary caſes of retention of urine, the natural ſhape of the bladder does not undergo any material change; but ſtill all its dimenſions do not increaſe in the ſame proportion. It ſpreads more from below upward than in any other direction. Its inferior portion becomes broader, and more deeply ſituated, preſſing downwards and forwards the perineum; and propelling, in women, the vagina backwards; or, in the male ſubject, the rectum. In theſe latter tubes, it forms a ſwelling, which either completely or partially obſtructs them, and interrupts the paſſage of the feces through the rectum. The poſterior part of the bladder, which is covered by the peritoneum, lifts upward and backward the maſs of ſmall inteſtines, and riſes into the cavity of the belly. The extreme part of its fundus mounts above the os pubis, and, as it were, inſinuates itſelf between the peritoneum, which it raiſes, and the abdominal muſcles. Indeed, the anterior and ſuperior portion of the bladder forms a ſwelling in the hypogaſtric region, and is in actual contact with the recti and tranſverſales muſcles, with which it is connected by means of a looſe cellular ſubſtance. The knowledge of this laſt diſpoſition of the parts is of great importance to the ſurgeon, ſince it leads him to underſtand, that the bladder admits of being punctured, without any danger of wounding the peritoneum, and cauſing an extravaſation of urine. It is not uncommon (ſays Deſault) to find in bladders, which have ſuffered ſuch diſtention, cells or pouches often containing calculi, and ſituated between the faſciculi of fleſhy fibres. See Urinary *Calculi*.

When the urine has diftended the bladder to the utmoft, and the obftruction in the urethra continues unremoved, that fluid next collects in the ureters, which in their turn become dilated. The fort of valve which covers their termination in the bladder difappears, and the opening, by which each of thefe tubes communicates with this receptacle, fometimes becomes nearly an inch in diameter. As the diforder advances, no more urine can at length defcend from the kidneys, and the fecretion is totally fuppreffed.

To the well-informed furgeon, the diagnofis of a retention of urine is generally attended with no difficulty; but the cafe is far otherwife to the man whofe experience and attention to the fubject have been very circumfcribed. What Default has called the *rational* fymptoms are numerous; but yet moft of them are of an equivocal nature: as, for inftance, the ftoppage of the difcharge of urine for one or feveral days; its evacuation by drops, or in very fmall quantities at a time; continual inclination to make water; the efforts which precede the performance of this function; the defire which the patient ftill feels to empty the bladder, after he has voided nearly as much urine as in the natural ftate; a diminution either of the force, or ftream of the urine; a fenfation of weight about the perineum, tenefmus, conftipation, hemorrhoids. To thefe fymptoms are to be added, acute pain in the hypogaftric region, extending along the urethra to the extremity of the glans penis, and afterwards towards the kidneys, fometimes attended with ftupor and numbnefs of the thighs. The pain is rendered much worfe when the patient walks about, coughs, or keeps himfelf in an erect pofition; and it is leffened when he bends his body forward, and relaxes the mufcles of the abdomen. Laftly, we have to join to the foregoing fymptoms, fever, naufea, laborious refpiration, and perfpiration, that is faid to poffefs a decided urinary odour.

All thefe *rational* fymptoms, as they were denominated by Default, are vague and uncertain. The whole of them together can only afford more or lefs probable conjectures refpecting the exiftence of a retention of urine. The certainty of the thing can never be made out, unlefs there be combined with the preceding defcription of complaints an obvious and manifeft tumour, formed by the bladder, not only above the pubes, but likewife in the rectum of the male, and in the vagina of the female fubject. The fwelling above the os pubis varies confiderably in its fize. Sometimes it reaches above the navel. It is circumfcribed, and unattended with any alteration in the colour of the fkin, or any hardnefs at its circumference. It is more expanded below than above, elaftic, and free from tendernefs; except it be preffed upon with force, and then the propenfity to make water is increafed, and fometimes a few drops are even urged out of the urethra.

The fwelling in the rectum or vagina is readily difcovered by manual examination. It is fituated only at the anterior fide of thefe cavities; and, like the hypogaftric tumour, it is every where elaftic, equal, and free from any particular indurations.

Another pathognomonic fymptom, deferving the utmoft attention of the practitioner, is the fluctuation, or rather the fort of undulation, which is perceptible on alternately preffing upon both the fwellings. Thefe, however, do not conftantly exift; for, as Default remarks, retentions of urine, even of the moft complete kind, have been known to occur, where the bladder, not being very extenfible, hardly contained a few fpoonfuls of urine.

Mr. Hey has not adverted to the fwelling in the rectum, or vagina; nor to the cafes of contracted bladder, where, of courfe, the information derived in ordinary inftances from the tumour above the pubes, could not be acquired; but, in other refpects, his obfervations on the diagnofis are practical and correct. According to this experienced writer, the characteriftic fymptom of a retention of urine, previous to the introduction of the catheter, is a diftention of the bladder (to be perceived by an examination of the hypogaftrium), after the patient has difcharged all the urine which he is capable of expelling.

"As this complaint may fubfift when the flow of urine from the bladder is by no means totally fuppreffed, great caution is required to avoid miftakes on this fubject.

"Violent efforts to make water are often excited at intervals; and during thefe ftrainings, fmall quantities of urine are expelled. Under thefe circumftances, the diforder may be miftaken for the ftrangury.

"At other times, a morbid retention of urine fubfifts, when the patient can make water with a ftream, and difcharge a quantity equal to that which is commonly difcharged by a perfon in health. Under this circumftance, I have known the pain in the hypogaftrium, and diftention of the bladder, continue till the patient was relieved by the catheter.

"And, laftly, it fometimes happens that, when the bladder has fuffered its utmoft diftention, the urine runs off by the urethra as faft as it is brought into the bladder by the ureters. I have (fays Mr. Hey) repeatedly known this circumftance caufe a ferious mifapprehenfion of the true nature of the difeafe.

"In every cafe of retention of urine which I have feen, the difeafe might be afcertained by an examination of the hypogaftrium, taken in connection with the other fymptoms. The diftended bladder forms there a hard and circumfcribed tumour, giving pain to the patient when preffed with the hand. Some obfcurity may arife upon the examination of a very corpulent perfon; but in all doubtful cafes, the catheter fhould be introduced." Pract. Obf. p. 389.

A retention of urine is always a ferious difeafe, and when it is complete, it demands the moft prompt fuccour. When relief is too long deferred, the confequences are truly afflicting; for, when the bladder continues for a time preternaturally diftended, it lofes its contractile power, which it recovers with difficulty. Irritated alfo by the quantity, and perhaps by the quality of the confined fluid, it foon becomes affected with inflammation and gangrenous mifchief.

Sometimes the bladder burfts, and the urine is extravafated in the cellular membrane of the pelvis; fpreading behind the peritoneum as far up as the loins; producing fwellings in the perineum; and becoming effufed alfo in the fcrotum, common integuments of the penis, and upper part of the thighs. Indeed, as Default remarks, the urine has fometimes been known to be effufed in the parietes of the abdomen, as far up as the fides of the cheft, producing gangrenous abfceffes and fiftulæ of the parts. To thefe evils are to be added others, arifing from the total interruption of the fecretion of urine, and from the abforption of a part of that which is confined in the bladder.

In the treatment of every retention of urine, there are two principal indications. The firft is to give fpeedy iffue to this fluid, in order to prevent the foregoing difaftrous confequences; the fecond is to obviate the caufes which prevent its expulfion from the bladder. At prefent we fhall confider only the firft of thefe indications, as the fecond can be more appropriately treated of when we come to notice the various caufes of the complaint.

The urine is commonly let out of the bladder by the introduction of an inftrument termed a catheter. Default confiders this operation in two points of view; firft, when the urethra

urethra is unobstructed, and the instrument can be introduced without resistance; and, secondly, when there exists an impediment to its introduction. As the history of these obstacles cannot be separated from that of the causes of the disorder, we shall follow Desault, and now only take into consideration the operation of introducing the catheter when the urethra is pervious. What ought to be the conduct of the surgeon under other circumstances will be noticed hereafter.

With respect to catheters, three things are to be considered: 1, the instrument itself; 2, the manner of introducing it; and, 3, the line of conduct to be pursued after its introduction.

Catheters were anciently composed of copper: Celsus knew of no other kind. As these, however, had the inconvenience of becoming incrusted with verdigrease, they at length fell into disuse, and others, made of silver, were substituted for them. This change had been made as early as the time of the Arabian practitioners, and it still receives the approbation of the best modern surgeons.

Catheters vary considerably in their length. For an adult female subject, they should be about six inches long; and for young girls, four or five. For grown-up men, the length ought to be about ten inches and a half; and for male children and boys, six or eight inches. These are the ordinary lengths. There is also much diversity in the size or thickness of the instrument. For a woman, the diameter ought to be about two lines; and for young girls, a line and a half. For male adult subjects, Desault recommends the thickness of two lines and one-third; and for boys, that of a line and a half. In general, whenever the urethra is pervious, it is better to follow the advice of Desault, and employ a largish catheter, which will enter the passage more easily, not get entangled in the folds of the membranous lining of the canal, and afford a more ready outlet for the urine. On the other hand, small catheters should be preferred, when there are obstructions and indurations in the passage.

Catheters also differ in shape. Those which Desault used had only a slight curvature of one-third of their length; a curvature which began insensibly from their straight part, and continued to their beaks inclusively. The curvature was also regular, so as to form the segment of a circle six inches in diameter. The female catheter, however, had only a slight curvature towards its beak; a shape which is adapted to the direction of the meatus urinarius. Desault also improved silver catheters, by causing them to be made with elliptical openings at the sides of the beak, with rounded edges, instead of the longitudinal slits, which were previously constructed. The inconvenience of these slits had been acknowledged by every practitioner in surgery; the lining of the urethra having been frequently entangled in them, pinched and lacerated, which produced acute pain, and sometimes profuse hemorrhage. With a view of preventing these evils, Desault also was careful to fill the elliptical openings with lard, which could not fall into the hollow of the catheter, as an elastic gum bougie was passed into the cavity of the instrument, in order to hinder the occurrence, and was not withdrawn before the end of the catheter was actually in the bladder. See Œuvres Chir. de Desault, t. iii. p. 118, &c.

Besides silver, or inflexible catheters, surgeons now frequently employ flexible catheters, made of elastic gum. These last instruments, indeed, are of so much importance, that they may be said to constitute one of the greatest improvements in modern surgery. They are stated to have been originally invented by a Frenchman of the name of Bernard. Imperfect attempts, however, had been made by others, at an earlier period, to invent catheters possessing the property of flexibility. Van Helmont proposed the use of catheters made of horn; but this substance was found to be too stiff, and to become very quickly incrusted with depositions from the urine. Fabricius ab Aquapendente recommended the employment of flexible catheters made of leather; but these were objectionable, as they were very soon softened by the urine and mucus of the urethra, so that they shrivelled up, and were rendered impervious. There were also other flexible catheters, formerly tried, which were composed of spiral springs of silver wire, covered with the skins of particular animals. These last were found to spoil very quickly, in consequence of putrefaction; and when left in the urethra any time, the beak was sometimes entirely separated from the rest of the instrument, and left behind.

The elastic gum catheters now in use are liable to none of the preceding inconveniences. They are formed of silk tubes expressly woven for the purpose, and covered with a coat of elastic gum. They are sufficiently flexible to accommodate themselves to the different curvatures of the urethra; they are not softened by the urine, and they constantly remain with their cavity unobliterated. Their smooth and polished surface makes them continue a long while free from incrustations of the urine. Sometimes they are introduced without a stilet or wire, which is passed into their canal, for the purpose of giving them a certain curvature, and greater degree of firmness. This plan is adopted when the catheter will not pass with the stilet; but, in general, the stilet is employed and withdrawn as soon as the tube is in the bladder.

There are two methods of introducing a catheter; *viz.* with the concavity turned towards the abdomen; or, on the other hand, with the concavity of the instrument turned downwards in the first stage of the operation. The latter plan of course requires the instrument to be turned as soon as its beak has arrived in the perineum; and, consequently, the French surgeons distinguish this method by the name of the "tour de mâitre." The operation of introducing a catheter, or catheterism, as it is sometimes termed, may be practised either when the patient is sitting up or lying down: the last position, however, is accounted the most favourable. When the catheter is introduced, with its concavity turned upward, and the patient is in the recumbent posture, the thighs are to be separated, and the legs moderately bent. The surgeon is to draw back the prepuce, and to hold the penis between the thumb and fore-finger of his left hand, which are to be applied on each side of the corona glandis, and not at all to the under surface of the penis; as this would press upon the urethra, and obstruct the entrance of the catheter. The handle of the instrument being now held parallel to the axis of the body, its beak is to be introduced into the urethra. While the penis is extended and drawn forward, as it were, over the catheter, the latter instrument is to be gently pushed on, until its beak has arrived as far as the arch of the pubes. At this particular moment, the handle is to be depressed towards the patient's thighs, and the manœuvre, well managed, generally at once directs the end of the catheter, through the prostatic portion of the urethra, into the cavity of the bladder.

When the catheter is to be introduced with its concavity turned downwards, or by the "tour de mâitre," the beak of it is to be passed into the urethra, and the penis drawn forwards over it, as it were, just as in the foregoing method. As soon, however, as the end of the catheter has reached the point at which the canal begins to form a curve under the pubes, the surgeon is to make the penis and the instrument

ment perform a femicircular movement, by inclining them towards the oppofite groin, and thence towards the abdomen. In the execution of this manœuvre, care is to be taken to keep the beak of the catheter ftationary, fo that it may be the centre of the movement, and fimply revolve upon itfelf. The handle of the inftrument is then to be depreffed, and the operation finifhed exactly in the fame manner as when the other mode is purfued.

As Default properly obferves, the only circumftance in which the two methods differ is, that, in one, the fame thing is performed by two movements, which is done in the other by one; fo that the operation is protracted, and rendered more difficult and painful. Hence, the majority of good furgeons never practife the "tour de maître," except when their patients are either corpulent, or placed in the pofition ufually chofen for lithotomy, when the other mode of introducing the catheter would be lefs convenient.

When the urethra is free from obftruction, an experienced furgeon can generally fucceed in introducing a catheter into the bladder, without any difficulty or force. But this operation, which is fo eafy to furgeons accuftomed to it, frequently proves extremely difficult to young practitioners, who, inftead of guiding the inftrument in the courfe of the urethra, create obftacles by preffing its beak againft the parietes of this canal, or entangling the inftrument in folds of its membranous lining. When this happens, it muft be withdrawn a little, in order to be pufhed on again, with its direction fomewhat altered. If this fecond attempt fhould not anfwer better than the firft, and the catheter fhould be ftopped in the perineum, the furgeon muft apply his fingers to the latter part, in order to difcover towards which fide the beak of the catheter has deviated, and to guide it properly as it paffes further.

When the catheter cannot be got through the portion of the urethra, which is contiguous to the rectum, the forefinger ought to be introduced into the bowel, for the purpofe of fupporting the end of the inftrument, and rendering the coats of the inteftine fomewhat tenfe, by drawing them a little downward and forward. If all thefe expedients fhould fail, the catheter fhould be changed for one of larger or fmaller fize, or of another curvature. A gum elaftic catheter ought alfo to be tried, without the ftilet. In no cafe, however, is it juftifiable to pufh forward the catheter with much force, left the urethra fhould be lacerated, and a falfe paffage produced.

The depth to which the catheter has entered, the ceffation of any feeling of refiftance to the motions of the beak, when revolved upon its axis, and the iffue of the urine, are the circumftances by which the furgeon knows that the inftrument has paffed into the bladder.

According to the experience of Default, the practice of letting out gradually only a part of the urine, after the catheter has been introduced, is on every account wrong and detrimental. He alfo difapproves of running into the oppofite extreme, that is to fay, of letting the urine flow out of the bladder, through a catheter, as faft as it arrives in this receptacle: as, by the laft practice, the bladder is conftantly kept in a ftate of relaxation, its fibres cannot recover their proper tone. When alfo the bladder is continually empty, it comes into contact with the end of the catheter; a circumftance which has fometimes caufed confiderable irritation, pain, and even ulceration of that vifcus. Befides thefe inconveniences, there are other objections: the catheter becomes fooner obftructed with mucus, and covered with incruftations, than when it is clofed with the ftilet. The patients are likewife compelled to remain in bed, where they are either wet with their urine, or obliged to have inceffantly a pot for its reception. The beft practice, therefore, feems to be that of letting out all the urine, as foon as the catheter is introduced, and then clofing the inftrument until the bladder has become moderately diftended again. Experience proves, that fuch moderate diftention and relaxation of the mufcular fibres of the bladder, alternately kept up, have the fame good effects on the organ, as moderate exercife has upon other parts of the body.

When an elaftic gum catheter is ufed, care muft be taken that it does not pafs unneceffarily far into the bladder; and if it be too long, a part of it ought to be cut off.

When a catheter is to be left in the urethra, it fhould always be properly fixed with a narrow piece of tape, or elfe it is apt to flip out, or fometimes even to pafs too far down the paffage. Some furgeons ufe cotton thread for this purpofe: they firft faften it to the rings, or round the outer portion of the catheter, and then carry its two ends fome way along the dorfum of the penis, when a fort of noofe is made, and the thread carried round the part and tied. When a filver catheter is employed, a tape or narrow ribband is paffed through each of the rings, and conveyed to the right and left fide of the pelvis, where it may be faftened to a circular bandage. But there are numerous methods of fixing, which need not be fpecified; for, although they are of importance, the principles, which ought to be obferved in adopting them, are the main things to be underftood. Thefe are, firft, never to fix a catheter in fuch a way, that too much of the inftrument projects into the cavity of the bladder; and, fecondly, to be careful that the thread, or tape, which is applied, will not chafe and irritate the parts.

Having premifed thefe general obfervations on the chief indication in cafes of retention of urine, *viz.* that of giving iffue to this fluid, we next follow Default, in order to confider the particular modifications to which the indication is liable; a fubject which cannot be comprehended, without treating alfo of the caufes of the difeafe.

1. *Of the Retention of Urine to which Perfons of advanced Age are liable.*—Old men are fo frequently afflicted with retention of urine, that the diforder is generally allowed to be one of the grievances to which their period of life is particularly expofed. The bladder, like the reft of the body, becoming lefs irritable, is no longer duly ftimulated by the prefence of the urine, and is only apprifed of the neceffity of emptying itfelf by the painful fenfation arifing from the diftention of its coats. It then contracts; but, to ufe Default's expreffion, its elongated fibres have hardly force enough to overcome the natural reaction oppofed to them by the canal of the urethra. There is almoft an equilibrium betwixt the power and the refiftance, and the urine could not flow out, if it were not for the affiftance derived from the powerful action of the abdominal mufcles. Nor is the expulfion of the urine even now complete, fince the bladder no longer retains fufficient contractile power to efface the whole of its cavity. Some drops of the urine, after each evacuation, are ftill left undifcharged, and already conftitute an incipient retention. The quantity daily augments, and the fibres of the bladder becoming habituated to the prefence of the urine, it happens at length that, at each evacuation, not more than half the fluid contained in this organ is actually voided.

According to the obfervations of Default, all old men are not equally liable to the complaint. It particularly attacks thofe who are of a phlegmatic temperament, plethoric, and of fedentary and ftudious habits. It alfo efpecially afflicts thofe who, from careleffnefs or indolence, do not give themfelves time to expel the laft drops of urine; and others,

others, who make a practice of voiding their urine into a pot as they lie in bed, instead of getting up to make the evacuation. "Although," says Bichat, "the latter fact may not be explicable upon any physiological principles, its truth is sufficiently established by clinical observation, and we cannot doubt its reality." Thus, the history of the patients' lives, their age, and kind of constitutions, form so many grounds for suspecting the nature of this species of retention of urine; but the suspicion is changed into certainty, when the following circumstances are joined with the usual symptoms of a retention of urine in the bladder.

The patients declare that they have never had in the urethra, or neighbouring parts, any affection capable of impeding the issue of the urine; that this fluid has always come away freely, and in a full stream; but that, although the stream was undiminished, the urine could not be discharged with the same force, nor to the same distance, as formerly. At length, instead of describing an arch as it flows out, it falls down perpendicularly between the legs. Towards the close of the evacuation, the patient also is no longer sensible of the final contractile effort of the bladder to expel the last portion of the urine; a particular sensation, of which he used to be conscious in his younger days. When he is about to make water, he likewise finds that he has to wait some time before the evacuation commences. As the disorder increases, he begins to perceive that he cannot make water without considerable efforts; that the quantity of urine, voided each time, manifestly decreases; that the desire to empty the bladder becomes more and more frequent; and, lastly, that the urine only comes away by drops, and that an incontinence has succeeded to a retention.

In this state, the patient's sufferings are not very great. The tumour, formed by the bladder above the pubes, is almost indolent; and, if it be pressed upon with some force, a certain quantity of urine is discharged from the urethra.

The retention of urine arising from old age is seldom complete: the urine, after having filled and distended the bladder, dribbles out of the urethra, so that the patient voids as much of this fluid in a given time as he does in a state of health. Nor is this species of retention of urine commonly attended with very urgent symptoms. It does not occasion, like complete retentions, a suppression of the urinary secretion in the kidneys; and as the urine escapes through the urethra, after the bladder is distended to a certain degree, the disorder is less apt to produce a rupture of this organ, and dangerous extravasations of the urine. The swelling of the bladder then continues, without the patient being seriously annoyed, except by a sense of weight about the pubes and perineum. Sabatier has seen patients, who have laboured under the disease six months, without ever having suspected its nature. The escape of the urine has indeed sometimes deceived surgeons, and led them to consider the swelling to be of a totally different character. Sabatier once attended a lady, who had been recommended to resort to a distant town, in order to try the effect of its mineral waters in dispersing a swelling brought on during her confinement in childbed, and which proved to be nothing more than a distention of the bladder with urine.

There are many old men who have been troubled with this sort of retention of urine a long time, and yet make no endeavour to get relief, supposing that the infirmity is natural to their period of life. The urine, however, stagnating in the bladder, undergoes a decomposition, and the coats of that organ itself at length become diseased.

This case presents two indications, *viz.* to evacuate the urine, and to restore the tone of the bladder; frequently, both these things may be accomplished by the same means. When the retention is incipient, and the bladder is merely in an inactive state, its proper action may often be restored by laying cold applications upon the hypogastric region, or the thighs, and by the patient going from a warm into a cool place, in order to make water.

The patient must also be strictly careful not to defer making water immediately the least inclination is felt to do so; for, when the call of nature is not at once attended to, the distended fibres of the bladder lose their sensibility more and more; the desire to make water subsides; and the retention, which at first consisted of only a few drops, very soon becomes complete. It would then be in vain, as Desault observes, to have recourse to the means which have been above recommended. No stimulus will now make the bladder contract with sufficient force to expel the mass of urine which it contains, and the catheter is the only thing by which this fluid can be discharged. This artificial mode of evacuation, however, only affords momentary relief; for, as the relaxed fibres of the bladder are slow in recovering their natural tone, the patient would necessarily fall into the same condition again, if the employment of the catheter were not continued. Hence, it is absolutely indispensable either to leave this instrument in the bladder, or to introduce it as often as the patient has occasion to make water. When there is a skilful surgeon constantly at hand, or when the patient knows how to pass the catheter himself, Desault thinks it better only to introduce the instrument when the bladder is to be emptied; by which means, the inconvenience arising from the continual presence of a foreign body is avoided. In this case, either a silver catheter or an elastic gum one may be used with equal advantage; but if the instrument is to be kept in the bladder, that made of elastic gum, and provided with a curved stilet, is to be preferred. Whatever sort of instrument is used, however, experience fully proves, that in old subjects, in whom the canal is as it were flaccid, a large catheter enters more easily, and with less pain, than one of smaller diameter.

As the treatment of the complaint must be continued for a long while, and the bladder seldom perfectly regains its proper tone in old age, the patient should be instructed how to introduce the catheter himself, and he is to pass it whenever he wants to make water. After a certain time, however, he may try if he can empty the bladder without this instrument. When he finds that he can expel the urine, he should certify himself by means of the catheter, that the last drops of this fluid are duly voided. Should they not be so, he must persevere in the use of that instrument. Without this precaution, says Desault, the retention will soon attain the same pitch again, at which it was on first commencing the treatment.

In this sort of retention of urine, it has been proposed to throw into the bladder a variety of astringent injections, made with the sulphate of iron, decoction of bark, &c. Desault tried them, but never found much good from their use.

Warm, balsamic, diuretic medicines, cold bathing, and liniments containing the tinctura lyttæ, have likewise been praised; but, according to Desault, these means frequently prove hurtful to persons of advanced years, and are seldom useful. He restricted his own practice to the use of the catheter, which, when skilfully employed, often restored the tone of the bladder; and when it failed, other means also were ineffectual.

2. *Retention of Urine from Debauchery.*—This case, as Desault observes, is very analogous to that which depends upon old age; both of them are unconnected with any previous disease

difeafe of the bladder, and fimply originate from general languor and debility. Their commencement is indicated by the fame circumftances, their progrefs is fimilar, they exhibit refembling fymptoms, and they merely differ in their predifpofing caufe; the defect of irritability being in one cafe the confequence of old age, in the other that of intemperance. In the former inftance, the diforder depends upon a decrepitude, the natural effect of advanced age; in the other, it arifes, as it were, from a premature and unnatural old age. Nothing is more weakening to the conftitution than an immoderate indulgence in venereal pleafures. From this kind of excefs, the bladder, as well as other organs, becomes lefs irritable, and is at length rendered totally incapable of expelling the whole of the urine. Hence originates a retention. It is unneceffary here to repeat the diagnoftic figns of this diforder, depending upon weaknefs of the bladder. The hiftory of the cafe can alone difcriminate it from that which is produced by old age. The prognofis, however, is not fo unfavourable as in the other example; for, when the patient is gifted with a ftrong conftitution, and he has not been too much reduced, the complaint may be radically cured.

An elaftic gum catheter left in the bladder is here, according to Default, one of the moft powerful means of relief which can be employed. It not only has the advantage of affording a ready outlet for the urine, exciting the irritability of the bladder, and promoting the action of its mufcular fibres; but its continual prefence in the urethra hinders the patient from yielding to thofe depraved habits, which are the very caufe of the diforder. The latter ufe of the catheter is the more worthy of confideration, inafmuch as it is proved by experience, that moft patients, who are not reftrained by this obftacle, cannot refift the force of habit, though fully aware of the dangers.

Together with the employment of the elaftic gum catheter, every endeavour fhould be made to ftrengthen the patient, and obviate the general relaxation and debility of the parts. Cold bathing, fteel medicines, and cinchona, are the means which are ufually preferred. The patient ought likewife to have the advantage of a falubrious air, nutritious and eafily digeftible food, undifturbed fleep, plenty of exercife, regular evacuations, tranquillity of mind; and more efpecially he ought to be diverted from what has been the caufe of his indifpofition.

3. *Retention of Urine from the immoderate Ufe of Diuretics.*—This is the next cafe which Default confiders. Diuretics, both cold and warm, taken in excefs, may equally occafion the diforder. He conceived that, by the former, the fibres of the bladder were hurtfully relaxed; and that, by the latter, their proper fenfibility was gradually deftroyed. In this laft circumftance, the bladder being habituated to the impreffion of ftimulating diuretics, is, when thefe are difcontinued, not fufficiently irritated by the urine to contract, and it no longer obeys the calls of nature. Default has the candour, however, to acknowledge that the foregoing theory is rather founded upon reafon than experience; he even confeffes that he has met with no example eftablifhing its reality, but he thought there was fome probability in it, deduced from the well-known effects of ftrong liquors on the ftomach.

If we exclude from confideration the information refpecting the nature and quantity of the drink which the patient has been taking, before the functions of the urinary organs were difturbed, there are abfolutely no circumftances, nor fymptoms, by which this fpecies of retention of urine can be diftinguifhed from that induced by old age and intemperance; nor is the local treatment to be different from what has been advifed for the above cafes. Befides the ufe of the elaftic gum catheter, the furgeon muft recommend cold bathing; the throwing of ice-cold water on the abdomen, perineum, and thighs; the application to the fame parts of compreffes wet with vinegar; dry friction on the hypogaftric region; or ftimulating liniments, containing ammonia or the tinctura lyttæ. Should all thefe means prove ineffectual, a blifter may be laid over the facrum and lower part of the loins; and it may either be kept open, or healed and then applied again, as Default particularly advifed.

4. *Retention of Urine from an Affection of the Nerves of the Bladder.*—Thefe nerves may be affected either at their origin, or in the courfe of their diftribution. Injuries of the brain are feldom followed by a retention of urine; but the complaint often accompanies thofe of the fpinal marrow. A concuffion of this medullary fubftance, from blows or falls upon the vertebral column; the injury which it fuffers in fractures and diflocations of the vertebræ, or from a violent ftrain of the back; its compreffion by blood, purulent matter, or other fluid effufed in the vertebral canal; and the effects which a caries of the fpine has upon it, may all operate as fo many caufes of a retention of urine. This form of the complaint may alfo be the confequence of tumours fituated in the track of the nerves which are diftributed to the bladder. It is not neceffary that all the nerves, which ramify on this organ, be affected before the complaint is occafioned; for the compreffion of fome of the nervous filaments is adequate to weaken the action of the bladder, and render it incapable of overcoming the natural refiftance to the difcharge of the urine.

When a retention of urine is caufed by an affection of the fpinal marrow, an infenfibility and weaknefs of the lower extremities are almoft always concomitant fymptoms. The patients fuffer very little; moft of them are ignorant of their condition, and do not complain of any thing being wrong in the functions of the urinary organs. The furgeon, aware that a retention of urine is a very common occurrence in thefe cafes, fhould examine whether any interruption of the evacuation prevails, either by feeling the ftate of the abdomen juft above the pubes, or by introducing a catheter.

As this fpecies of retention of urine is only fymptomatic, and not dependent upon any previous defect in the bladder, it is not in itfelf alarming; but, with reference to the caufe that has produced it, it is exceedingly dangerous. Affections of the fpine, complicated with injury of the fpinal marrow, are frequently fatal. By means of a catheter, it is always eafy to relieve the inconveniences arifing from the bladder not contracting, and thus fulfil the only indication which this fort of retention of urine prefents, *viz.* the evacuation of the urine. But thefe means are merely palliative, and the bladder will not recover its contractile power until the caufes of its weaknefs are removed. The laft then is the main object in the treatment, which muft vary according to the nature and extent of the diforder.

The confideration in detail of all the means which may be requifite for the relief of the different accidents and difeafes of the fpine, would form too long a fubject to be brought into the prefent article. (See FRACTURES and LUXATIONS *of the Vertebræ*, and SPINE, *Difeafe and Curvature of.*) We fhall merely obferve here, that Default had a high opinion of the utility of cupping in fhocks and concuffions of the fpinal marrow. This was done on the part of the back which had been ftruck, or in its vicinity; and the fcarifications were multiplied according to the ftrength of the patient. The plan was fometimes repeated the fame day, and for feveral days in fucceffion; and when the patient could not bear the lofs of more blood, dry cupping was employed.

employed. In caries of the ſpine, Deſault alſo gave a preference to the uſe of the moxa, inſtead of cauſtic.

5. *Retention of Urine brought on by Diſtention of the Fibres of the Bladder.*—As Deſault obſerves, this ſpecies of retention of urine may be called *ſecondary*, ſince it is invariably preceded and produced by a *primary* retention. It follows of courſe, that its remote cauſes conſiſt of all thoſe circumſtances which may bring on the other forms of the complaint; but its immediate cauſe altogether depends upon the weakneſs and loſs of irritability in the bladder, occaſioned by the immoderate diſtention of its coats. Thus, we frequently find the diſorder occur in perſons who, from baſhfulneſs, indolence, or intenſe occupation, neglect to make water when they firſt have the deſire, or who cannot for a time empty the bladder, in conſequence of ſome temporary obſtruction in the urethra. Although the impediment to the eſcape of the urine no longer exiſts, and the bladder is in other reſpects ſound, yet as this organ has been weakened by the exceſſive diſtention of its coats, it cannot contract with ſufficient force to obliterate the whole of its cavity, and expel the laſt portion of urine.

The indication in this caſe is very ſimple, for there is not here, as in other retentions of urine, another diſeaſe to be remedied. The catheter, when left in the bladder, generally proves adequate to the reſtoration of the tone and contractile force of this viſcus. Deſault alſo conceived, that the object might be promoted by the exhibition of warm diuretics, and the employment of tonic injections, and other ſtrengthening means. Before the catheter is diſcontinued, the ſurgeon ought to be ſure that the bladder can completely expel the whole of the urine, without the aid of this inſtrument; for it is impoſſible to ſpecify any particular period when the bladder will regain its power of contracting. The time will vary according to the duration of the diſeaſe, and the age and conſtitution of the patient. In ſome perſons, a cure is effected in a few days; in ſome, not till after ſeveral weeks or months; and in others, the contractile function of the bladder is ſo irremediably deſtroyed, that the catheter is neceſſary during the reſt of the patient's life.

6. *Retention of Urine from Inflammation of the Bladder.*—The majority of authors who have written on the diſeaſes of the urinary organs, ſays Deſault, have aſcribed different effects to an inflammation of the neck of the bladder, and to the ſame affection of the body of this viſcus. They have in fact regarded the firſt occurrence as one of the cauſes of retention, and the laſt as a cauſe of incontinence of urine. It has been imagined, that an inflamed highly ſenſible bladder, inſtead of being weakened in this ſtate, acquired an increaſe of energy, and contracted with greater than ordinary vigour. But, even if we had not been undeceived upon this ſubject by the obſervation of retentions of urine, which could be referred to nothing but inflammation of the bladder, ſtill analogy would have protected us from error. We never find an inflamed muſcle contract, and if we oblige it to act, its action is always weak. Deſault alſo conſtantly noticed, in opening the bodies of perſons who had died of inflammation in the abdomen, that the inflamed inteſtines were diſtended, and not diminiſhed and contracted.

Plethoric bilious ſubjects, with full habits, are particularly liable to this ſpecies of retention. It is alſo frequently occaſioned by the abuſe of wine or other ſpirituous liquors, heating diuretic drinks, or the external or internal employment of cantharides. This form of the complaint makes its attack ſuddenly, and may be recognized; 1ſt, By the frequent deſire to make water. 2dly, By the acute pain in the region of the bladder; pain which is increaſed by the efforts to make water, and which ſhoots up to the loins and along the urethra to the end of the glans. 3dly, By the frequency and hardneſs of the pulſe, and other ſymptoms of fever. 4thly, By the aggravation of the pain, when the hypogaſtric region is handled or preſſed upon. 5thly, By the eaſy paſſage of a catheter into the bladder. 6thly, By the acute pain which is excited by the inſtrument touching the inſide of the bladder. 7thly, By the red inflammatory colour of the urine. 8thly, By the abſence of all thoſe ſymptoms which peculiarly characterize other caſes of retention.

This form of the diſorder demands the moſt prompt aſſiſtance. The urine, the preſence of which is a new ſource of irritation, ſhould be immediately drawn off. The catheter ſhould be introduced with great gentleneſs, and merely far enough to let its eye get beyond the neck of the bladder, as its beak might otherwiſe ſeriouſly irritate this viſcus, the lining of which is now extremely ſenſible.

After the urine had been diſcharged, Deſault uſed to throw in mucilaginous injections; but of theſe we entertain no opinion. The inflammation of the bladder is to be reſiſted by the moſt powerful antiphlogiſtic remedies, ſuch as repeated veneſection, the application of leeches to the perineum and hypogaſtric region, the warm bath, glyſters, fomentations on the abdomen, and cold mucilaginous beverages. When, notwithſtanding theſe means, the inflammation increaſes, extends to the other abdominal viſcera attended with hiccough and vomiting, and continues beyond the ſixth day, the patient's life is in extreme danger, and death almoſt inevitable.

7. *Retention of Urine from Hernia of the Bladder.*—The ſecond volume of the Memoirs of the French Academy of Surgery preſents us with numerous inſtances of this ſpecies of retention of urine. We there learn that it is a ſymptom almoſt conſtantly attending hernia of the bladder. But the weakneſs of this organ is not always the ſole cauſe; for the urethra itſelf alſo makes greater reſiſtance than natural to the iſſue of the urine. The neck and adjoining part of the bladder are drawn out of their right poſition by the portion of this organ which protrudes. Hence, the beginning of the urethra alſo undergoes an elongation, and a change of its curvature, by being preſſed towards the ſymphyſis of the pubes, and its diameter is likewiſe diminiſhed. The urine may alſo be detained in the pouch compoſing the hernia, in conſequence of the communication between this and the other part of the bladder being too diminutive. This ſtate, indeed, is very common, and it accounts for thoſe partial retentions of urine which take place only in the protruded portion of the bladder, and not in that of the receptacle which lies within the pelvis. Sometimes, however, ſuch retentions depend upon the preſſure of the abdominal muſcles being removed, and upon weakneſs of the protruded part of the bladder. At the ſame time, it rarely happens that the reſt of this organ, ſituated in the pelvis, can itſelf expel the laſt drops of the urine which it contains. Its complete contraction cannot be accompliſhed without great difficulty; and, in the end, it almoſt invariably follows that the urine is retained in both the protruded and unprotruded portions of the bladder.

When a retention, ariſing from a hernia of the bladder, is complete, and occurs in both parts of this organ, there is, in addition to the ſymptoms common to other retentions produced by weakneſs of the bladder, a more or leſs conſiderable ſwelling in the ſituation of the hernia. The tumour is unattended with any change of the colour of the ſkin; is not very tender on being handled; and it preſents a feeling of fluctuation, ſometimes obſcure, ſometimes very diſtinct. When the ſwelling is preſſed upon, the deſire to make water is excited or increaſed, and occaſionally a few drops eſcape from

from the urethra. As ſoon as the urine has been drawn off with a catheter, the part of the bladder which is out of the pelvis ſubſides, on the patient being put into a poſture in which ſuch portion of the bladder is higher than the reſt of this organ within the pelvis. The hernial tumour ſeems then to be compoſed of thick membranes, which are ſoftiſh, moveable, but yet incapable of being reduced. It is alſo ſome time in enlarging again; and, after its re-appearance, it preſents the ſame ſymptoms as before.

When the retention of urine is confined to the hernia, and the opening, by which this communicates with the pelvis, is free, the tumour is indolent, increaſing when the patient empties the other part of the bladder, and ſubſiding after the evacuation. As ſoon, however, as this is finiſhed, the patient feels a deſire to make water again; ſo that there is a ſort of interval in the completion of this function. But, ſhould the communication with the pelvis not be open enough, the ſwelling would be incompreſſible, or it could not be made to ſubſide without a good deal of force. Were it ſtrangulated, the circumſtance would be indicated by the tenſion of the ſwelling, pain, heat, fever, and hiccough, ſucceeded by vomiting.

The firſt indication is to diſcharge the urine with a catheter, or by compreſſing the hernial tumour; but theſe expedients are only palliative. When the diſeaſe is recent, and the protruded portion of the bladder ſmall and reducible, the part ought to be returned and kept up with a truſs, by which means a perfect cure may be effected. When the part is adherent and irreducible, the ſwelling ought to be emptied, and a ſuſpenſory bandage made to fit and ſupport it. If the hernia were in this way gradually got into the abdominal ring again, a truſs would afterwards be requiſite. Propoſals have been made to endeavour to excite the adheſive inflammation in the cavity of the protruded part of the bladder, by methodical compreſſion, gradually increaſed, and obliterate the pouch in which the urine is lodged out of the pelvis. Although Deſault thought the attempt cautiouſly made juſtifiable, he deemed the reſult very uncertain.

Were the retention of urine accompanied with a ſtrangulated ſtate of the protruded bladder, and the contents could not be preſſed into the other part of this organ, a puncture of the ſwelling with a trocar might be proper. But if there were an enterocele alſo preſent, as often happens, this operation would be attended with riſk of injuring the inteſtine. Hence Deſault preferred opening the tumour by a careful inciſion; and he even approved of cutting away the protruded cyſt, if the communication betwixt it and the reſt of the bladder were obliterated.

8. *Retention of Urine cauſed by Diſplacement of the Viſcera of the Pelvis.*—Theſe diſplacements, which may occaſion a retention of urine, are a retroverſion, prolapſus, or inverſion of the uterus, and a prolapſus of the vagina and rectum. When the intimate connexions of the bladder with the uterus and vagina in the female, and with the rectum in the male, are conſidered, it is obvious that theſe latter parts cannot be diſplaced without drawing along with them the bladder; and that in this ſtate, whatever may be its contractile power, it cannot contract completely upon itſelf, ſo as to expel the whole of the urine. To this deficient action of the bladder is neceſſarily joined an increaſe of reſiſtance on the part of the urethra. The beginning of this canal, being drawn by the bladder, changes its accuſtomed direction, and ſuch alteration cannot be made without the ſides of the tube being preſſed together, and thus a more or leſs conſiderable obſtacle formed to the paſſage of the urine. It is in this manner that, in the retroverted uterus, the os tincæ, being carried up above the pubes, drags along with it the poſterior ſide of the bladder, which, in its turn, draws after it the commencement of the urethra, pulls it upwards, and increaſes the curvature which this canal deſcribes under the ſymphyſis of the pubes, againſt which it is forcibly applied.

In a prolapſus or inverſion of the womb, vagina, and rectum, the back part of the bladder, inſtead of being drawn upward and forward, is pulled downward and backward, and the curvature of the urethra is totally altered. Below the pubes, the bladder forms a convexity, and not a large concavity, as in the inſtance of a retroverſion of the womb. This poſition of the parts ſhould always be recollected in paſſing the catheter, as it ſhews what curvature and direction ſhould be given to the inſtrument, in order to facilitate its introduction.

The retention of urine, ariſing from diſplacement of the viſcera, may always be eaſily diſtinguiſhed from the other ſpecies of this diſorder. The ſymptoms, however, by which it is characterized, have been detailed in other articles, to which the reader is referred. See PROLAPSUS *Ani*, PROLAPSUS *Uteri*, VAGINA, UTERUS, *Retroverſion of*, &c.

Theſe kinds of retention of urine are not frequently followed by any very bad conſequences. It is generally ſufficient to rectify the wrong poſition of the bladder, and commencement of the urethra, by the reduction of the diſplaced viſcera, and a cure is then a matter of courſe, unleſs the exceſſive diſtention of the fibres of the bladder has induced conſiderable weakneſs in the parietes of this organ. When this is the caſe, we muſt have recourſe to the particular means which have been recommended for this cauſe of the diſeaſe. The reduction of the viſcera uſually conſtitutes the firſt indication.

For an account of the manner of doing this, we muſt refer to the above-mentioned articles. When the reduction cannot be immediately accompliſhed, or when it fails in directly relieving the retention of urine and ſymptoms depending upon it, the catheter is to be uſed. Frequently, when the urine has been drawn off, the reduction becomes more eaſy; but ſometimes the altered direction of the urethra makes the introduction of the catheter difficult; nor can ſucceſs be obtained, except by accommodating this inſtrument to the faulty ſtate of the canal. For example, in the retroverſion of the uterus, a catheter very much curved anſwers better than a ſtraight one, like that ordinarily uſed for females.

A curved catheter, ſays Deſault, alſo anſwers in caſes of prolapſus uteri, &c.; but with this difference, that, in a retroverſion, the concavity of the inſtrument muſt be turned towards the pubes, but, in the prolapſus, towards the anus. Sometimes the catheter will not paſs unleſs it be rotated, as it were; and ſometimes, when a ſilver catheter cannot in any manner be introduced, one made of elaſtic gum, which adapts itſelf better to the curvature of the canal, will readily enter.

Were every effort to reduce the viſcera and get a catheter into the bladder to fail, at the ſame time that a riſk of this viſcus burſting prevailed, the operation of puncturing it would become indiſpenſably neceſſary. See PARACENTESIS *of the Bladder*.

9. *Retention of Urine from the Preſſure of the Uterus, or Vagina, on the Neck of the Bladder.*—It is alleged, that in pregnancy there are two periods when women are particularly liable to a retention of urine; *viz.* during the fourth month, and at the time of labour. In order to have an exact idea of this caſe, we muſt remember that, in the firſt months after conception, the uterus continues to lie concealed in the pelvis; that it does not aſcend above this cavity till the fifth month, or later; that, at this period, as its ſize and weight

weight have progressively increased, it descends lower into the vagina, and compresses, in the manner of a wedge, the rectum, which is situated behind; while it presses the neck of the bladder and urethra, which are in front, against the symphysis of the pubes, sometimes in such a degree, as entirely to close them, and stop the passage of the urine through them.

From this account of the progress of the gravid uterus, the mechanism of this species of retention of urine appears so simple, and, as it were, natural, that one would expect to find the disorder frequently happen in the fourth and fifth months of pregnancy; yet, out of a great number of women who had been delivered in the Hôtel-Dieu at Paris, Desault did not meet with a single one who had been thus affected. He does not, however, presume to assert, that the complaint may not occur; but he believes, that the manner in which the uterus enlarges must almost always protect the neck of the bladder and urethra from compression. In fact, says he, it is well known that the increase of this viscus begins at its fundus, and then extends to its body, while the cervix retains its size and length until the sixth month, when the uterus, being too large to be contained in the lesser pelvis, mounts up above the superior aperture.

As this viscus is larger at its fundus than its cervix, while situated within the cavity of the pelvis, it must rather compress the ureters and body of the bladder than the neck of this organ and the urethra, above which the most bulky portion of the uterus is always situated, unless there be a complete prolapsus of this organ. Although most writers have spoken of a retention of urine as being often occasioned by the lodgment of the head of the fœtus, yet, according to Desault, not a single instance occurred at the Hôtel-Dieu, during eight or ten years, in which space of time fifteen or sixteen hundred patients were there delivered. Therefore, without denying altogether the possibility of the case, he conceives himself justified in concluding that it is much less common than is usually supposed. It is true, says he, women often complain of a desire to make water when the head of the child continues a long while in the passage; and such desire may have led some careless practitioners to imagine that it proceeded from a full state of the bladder, who ought to have known that any irritation about this organ would cause the same kind of sensation.

When the position of the head of the child, at the time of its being wedged in the lesser pelvis, is considered with regard to the bladder, it appears that the body of this last organ and the ureters are more exposed to compression than the urethra and neck of the bladder. Desault even thought it probable, that the urine, far from accumulating in this receptacle, could not descend into it, and was confined in the ureters.

This conjecture seemed to Desault the more likely, inasmuch as a retention of urine is more frequently a consequence of, than an attendant upon, the lodgment of the child's head in the passage. The complaint then comes not from any obstruction of the meatus urinarius, but from weakness of the bladder, which has suffered contusion, which sometimes causes sloughs between the vagina and bladder, and produces urinary fistulæ, always difficult of cure, and often incurable.

Were, however, a retention of urine to happen at one of the above periods of pregnancy, the diagnosis of it would be obvious enough. The state and position of the uterus, or the situation of the head of the infant, could easily be ascertained by manual examination; and the patient would be able to say whether the passage of urine had been previously free, and whether she knows of any other cause that can impede the evacuation.

Frequent inclination to make water, and none of the urine at the same time coming away, are, in this case, very equivocal signs of a retention; for, as Desault remarks, any irritation of the bladder will cause the first symptom, and the last may depend upon compression of the ureters.

If the complaint were caused, as is supposed, by the pressure of the uterus upon the neck of the bladder and the urethra, about the fourth month of pregnancy, we could not expect the disorder to be permanently relieved before the enlarged uterus had risen out of the pelvis. Until this had happened, the practitioner could only endeavour to facilitate the evacuation of urine by pressing the uterus away from the neck of the bladder and urethra, by introducing his finger sufficiently high behind, and a little on one side of the symphysis pubis. Should this method fail, it would be necessary to have recourse to the catheter.

Were the retention of urine produced by the child's head. delivery should be expedited by changing the position of the head with the forceps, &c. If the labour should still seem likely to be lingering, the urine ought to be drawn off with a catheter.

Besides the distention of the uterus and vagina in pregnancy and parturition, there are other conditions of these organs which may give rise to a retention of urine. This disorder sometimes arises from the presence of various kinds of tumours, or collections of blood or water in the uterus, or ovary; and it occasionally proceeds from distention of the vagina with the menstrual discharge, the use of pessaries, &c.

As this last kind of retention of urine is only symptomatic, the prognosis must be more or less unfavourable, according as the disease, of which it is a symptom, may happen to be more or less serious. It is of itself not very dangerous, because, by drawing off the urine with a catheter, it is always practicable to prevent or remove the inconveniences which it causes. But even the use of the catheter is not always necessary, especially when the cause of the retention of urine is easily removable, and the tone of the bladder is not impaired. This is generally the case when the complaint is induced by a pessary, or collection of blood in the vagina. In other examples, in which the cause of the difficulty of making water cannot be immediately obviated, as in several cases of tumours, the catheter must be employed. In scirrhous and cancerous diseases of the uterus, also, this instrument is the only means of relieving the retention of urine, as nature and art can do little for the removal of the cause. It ought to be known, however, that, as these last diseases increase, an incontinence often succeeds to a retention of urine, in consequence of ulceration taking place between the upper surface of the vagina and the lower part of the bladder.

10. *Retention of Urine from Pressure of the Rectum upon the Neck of the Bladder.*—Abscesses in the vicinity of this intestine, hemorrhoidal tumours, alvine concretions, and the scirrho-contracted state of the gut, &c. may bring on a retention of urine by making pressure on the neck of the bladder. The irritation, also, existing in these cases, may tend to produce the complaint by exciting a spasmodic contraction of the urethra. Here the relief of the obstruction of the urine is to be effected by removing or curing the other disorder, which operates as its cause. If this cannot be immediately accomplished, the catheter must be used, though, in several instances, it will be better to avoid even the irritation of the catheter, and try the effects of bleeding,

ing, the warm bath, and opium, which will frequently enable the patient to make water. The laſt means, however, will not ſuffice, when the cauſe of the retention is likely to continue any length of time.

11. *Retention of Urine from Tumours ſituated in the Bladder.*—Fungous diſeaſes, carcinoma, and hydatids, ſays Default, are the principal tumours which may cauſe a retention of urine. Of all the diſeaſes of the bladder, there are none which are ſo afflicting as fungous tumours; fortunately, they are not frequent. Default, however, had ſeen ſeveral caſes in the dead ſubject. By the introduction of a ſound into the bladder, the preſence of a fungus might be ſuſpected; ſomething unuſual would be felt; but the caſe could hardly be diſcriminated from an induration of the coats of the bladder, or other ſorts of tumours of this viſcus. The cauſes and mode of curing the affliction are equally unknown. In one inſtance, however, in which the fungous excreſcence had a narrow baſe, Default is ſaid to have made an inciſion into the bladder, and extracted the ſwelling with a pair of forceps. No hemorrhage, nor any other bad ſymptoms, enſued.

In carcinomatous diſeaſes of the bladder, the uſe of the catheter is neceſſary, at leaſt, until, by the progreſs of the diſorder, ulcerated communications are formed betwixt that organ and the rectum, or uterus and vagina.

12. *Retention of Urine from foreign Bodies in the Bladder.*—When the urine is obſtructed by a calculus at the neck of the bladder, the patient, by altering his poſition, frequently changes the ſituation of the ſtone, and he is immediately able to make water again. This expedient, however, will only procure relief while the calculus is looſe in the cavity of the bladder; for, after it has become fixed in the commencement of the urethra, it muſt either be puſhed back with a catheter, or extracted by a kind of operation reſembling the apparatus minor. See LITHOTOMY.

Default never met with any caſe in which the bladder contained worms; but he was aware of there being many ſuch inſtances on record. Tulpius, Schenckius, Bianchi, &c. have been eye-witneſſes of the occurrence. Theſe worms are not all alike; ſome reſemble ſcarabæi, ſome are like aſcarides, and others have the appearance of lumbrici. Ruyſch and Hagendorn affirm, that they have ſeen ſome which had wings, and were able to fly as ſoon as they were voided. An intereſting paper on this ſubject was publiſhed about ſix years ago by Mr. Lawrence, who met with an example in which an undeſcribed ſpecies of worms was abundantly voided from the bladder. "The origin of thoſe animals (ſays Mr. Lawrence), which inhabit the internal parts of living bodies, is involved in much obſcurity. Although the inteſtinal worms appear manifeſtly, from their peculiar form, conſiſtence, and organs, to be particularly deſigned for thoſe ſituations in which they are found; although they have generative organs, and no ſimilar animals are known to exiſt out of living bodies; yet, it has been generally conceived, that the genus from which they ſpring enter from the mouth. The production of hydatids in various parts of the body cannot, however, be accounted for on ſuch a ſuppoſition; neither can we very eaſily conceive that ova ſhould enter from without into the urinary organs." The following facts, alſo ſtated by Goeze, (as Mr. Lawrence obſerves,) entirely overturn this opinion. Profeſſor Brendel, of Gottingen, found aſcarides in the rectum of an immature embryo. Blumenbach diſcovered tæniæ in the inteſtinal canal of young dogs a few hours after birth, &c. Verſuch einer naturgeſchichte der Eingeweidewürmer, p. 55.

The caſe which Mr. Lawrence has recorded is intereſting, as it exhibits an unqueſtionable inſtance of peculiar and undeſcribed worms voided from the urinary paſſages. This gentleman ſays, that he knew of no other caſe in which a diſtinct ſpecies of worm has been clearly proved to come from the bladder. Moſt of the caſes publiſhed were inſtances of common inteſtinal round worms, which ſometimes perforate the inteſtines, and are diſcharged by abſceſſes, or get into the bladder, after the formation of adheſions betwixt this organ and the bowels. In other inſtances, coagula of blood, mucus, or portions of the mucous coat of the bladder, have been miſtaken for worms; and, as Mr. Lawrence further obſerves, ſome of the deſcriptions can apply only to larvæ of inſects. Two ſpecimens of this laſt ſort he has ſeen himſelf, which were ſent from the country as worms voided from the bladder. See Medico-Chir. Tranſ. vol. ii. p. 382, &c.

In whatever way theſe animals get into the bladder, a retention of urine may be produced, either when they are numerous, or when there is only one preſent, but large enough to obſtruct the veſical orifice of the urethra. In the very curious example related by Mr. Lawrence, the paſſage of the urine was obſtructed, and the uſe of the catheter continually neceſſary. The oil of turpentine was given internally, with ſome appearance of benefit at firſt; but it afterwards brought on febrile ſymptoms and eryſipelas, and its exhibition could not be kept up. It was then injected into the bladder, with an equal part of water. This rather accelerated the diſcharge of the worms; but they came away at times whether the injection was uſed or not, and as this means produced the eryſipelatous indiſpoſition again, it was left off. Olive oil was afterwards injected; the irritation after it was leſs, and the fits of pain about the bladder leſs violent. It was calculated, that at the time when Mr. Lawrence was writing the particulars of the caſe, from 800 to 1000 worms had been diſcharged. For a detail of the ſymptoms, and a particular deſcription of the worms themſelves, we muſt refer to the above-mentioned publication.

According to the obſervations of Default, a retention of urine is frequently occaſioned by coagula of blood in the bladder. The blood is ſaid ſometimes to come from the kidneys, ſometimes from the bladder, and ſometimes it even regurgitates from the urethra. While fluid, it may be expelled with the urine; but when coagulated, it is no longer capable of being diſcharged. It is the blood which gets into the bladder after wounds, or the operation of lithotomy, that is moſt diſpoſed to coagulate.

The diagnoſis of a retention of urine, produced by coagula of blood, is not very clear. The iſſue of blood with the urine might raiſe ſuſpicions; but there could be no certainty of the nature of the caſe, until the catheter were introduced. If the clots of blood ſhould be too large to paſs through this inſtrument, lukewarm water ſhould be injected into the bladder, for the purpoſe of looſening and diſſolving the coagula.

We ſhall merely notice one more example of retention of urine, ariſing from the preſence of extraneous ſubſtances in the bladder; we mean that in which a piece of bougie has ſlipped into this viſcus. It has frequently happened, that entire bougies, which were not properly fixed, have glided into the bladder. As Default obſerves, the urethra appears to poſſeſs a kind of antiperiſtaltic action, by which it tends to draw into the bladder whatever ſubſtances it includes; for, ſays he, it is conſtantly noticed, that when theſe ſubſtances are once within the urethra, if they be not expelled by the current of urine, they always advance towards the bladder.

bladder. This circumſtance cannot be accounted for by their weight, and it muſt be aſcribed to a contractile power of the urethra.

The bougies formerly made, and particularly metallic ones, and catheters made of ſpiral wire ſprings, frequently broke, and thus pieces of theſe inſtruments were often left in the bladder. Such an accident, however, is much leſs common now, that the fabrication of all ſorts of bougies and catheters has been brought to a high ſtate of perfection.

The inſinuation of theſe foreign bodies into the bladder is a ſerious occurrence both for the patient and ſurgeon. The former cannot avoid the conſequence, which will ſooner or later originate from the extraneous ſubſtance, except by ſubmitting to a dangerous and painful operation: the latter will be accuſed of being the author of all the evil, and will find it difficult to exculpate himſelf. In order to do away the neceſſity of cutting into the bladder, in ſuch caſes, Deſault propoſed the uſe of ſmall ſpring forceps, paſſed into the bladder through a cannula; but although the inſtrument ſeemed to anſwer on the dead ſubject, there have hitherto been no inſtances of its doing ſo on living patients.

We next proceed to notice the retentions of urine ariſing from affections of the urethra.

13. *Retention of Urine from Inflammation of the Urethra.*—It is eaſy, ſays Deſault, to conceive how inflammation of the urethra may occaſion a retention of urine. In order to underſtand the mechaniſm of the caſe, we need only remember the axiom in chirurgical pathology, that inflammation never exiſts without a ſwelling of the inflamed part, and that every tumefaction of the lining of the urethra muſt neceſſarily diminiſh its diameter. Inflammation of the urethra is moſt commonly produced by the external application, or internal exhibition, of cantharides, gonorrhœa, the unſkilful uſe of the catheter, the employment of ſtimulating injections, bougies, &c., together with the leſſening of the canal by the effect of ſwelling; there can alſo be no doubt, that, in many of theſe inſtances, a ſpaſmodic contraction of the urethra and neck of the bladder alſo contributes to the retention of urine. Deſault, indeed, entertained the opinion that inflamed parts, endued with a contractile power, were not diſpoſed to contract in that ſtate; yet, it ſhould be recollected, that even admitting this to be true, it ſeldom happens that the whole length of the urethra is inflamed, and that the reſt may be affected with a ſpaſmodic action. The effects of opium, tobacco, and other antiſpaſmodics, often evinced in immediately relieving theſe kinds of retention of urine, ſeem indeed to leave no doubt reſpecting the exiſtence of a ſort of ſpaſm in the paſſage. Whatever may be the cauſe of the inflammation of the urethra, the diagnoſis is free from all obſcurity. Beſides the general ſymptoms of inflammation, the patient complains of a ſcalding ſenſation in the paſſage; he experiences a great deal of ſmarting, which is ſometimes inſupportable when he makes water; the penis becomes in ſome degree ſwollen, and more tender; and a very little preſſure on the urethra gives acute pain. In the mean time, the ſtream of urine becomes gradually but yet quickly leſſened; and at length this fluid can only be voided in a very narrow current, or only by drops, and often not at all.

The diſorder is to be treated on antiphlogiſtic principles. Diluting, cooling, mucilaginous beverages, veneſection, leeches to the perineum, the warm-bath, opium, fomentations to this part and the penis, are the means which uſually ſuffice to give relief. When inflammation exiſts in the urethra, it is always deſirable to avoid, as long as poſſible, the employment of catheters, which create irritation, and of courſe increaſe the cauſe of the retention. It is particularly in caſes of this deſcription, and in the retentions of urine ariſing from ſtrictures, that Mr. Earle has ſuggeſted the uſe of tobacco in the form of clyſters; a method deſerving adoption when the means above enumerated are unavailing, and preferable to the uſe of the catheter, becauſe not occaſioning any increaſe of irritation and inflammation in the urethra. See Medical and Chir. Tranſ. vol. vi. p. 82, &c.

To this propoſal we ſhall advert again, in conſidering the retention originating from ſtrictures. When, in conſequence of inflammation, however, an abſceſs forms in the vicinity of the urethra, and burſts into this canal, the uſe of an elaſtic gum catheter is proper, in order to prevent the urine from inſinuating itſelf into the cavity which contains the pus.

14. *Retention of Urine from Laceration of the Urethra.*—The urethra is ſometimes ruptured by violent contuſions on the perineum, and the rough and unſkilful uſe of metallic catheters. The conſequences uſually are, an extravaſation of urine in the cellular membrane of the ſcrotum and penis; a conſiderable dark-coloured ſwelling of theſe parts, often followed by ſloughing; and retention of urine. Reſpecting ſuch caſes, we ſhall merely obſerve, that the treatment ought to conſiſt in introducing an elaſtic gum catheter into the bladder, and keeping it there until the breach of continuity in the canal is repaired. At the ſame time, the evils threatened from the effuſion of the urine are to be leſſened as much as poſſible, by making two or three free inciſions in a depending part of the ſwelling produced by the extravaſation. The tumour ſhould alſo be well fomented, and antiphlogiſtic means adopted.

15. *Retention of Urine ariſing from Tumours ſituated in the Perineum, in the Scrotum, or on the Penis.*—No conſiderable tumour can form in any of theſe ſituations, without making more or leſs preſſure on the canal of the urethra. Whether ſuch ſwelling proceed from a ſimple tumefaction of the parts, or from a collection of any fluid in a cavity, or from the lodgment of an extraneous body, the effect will be the ſame. A retention of urine has been obſerved to ariſe from phlegmonous ſwellings and abſceſſes, extravaſations of blood, and urinary tumours and calculi formed in the perineum and ſcrotum. The diſorder has alſo been known to be cauſed by a ſarcocele, hydrocele, a very large ſcrotal hernia, an aneuriſm of the corpus cavernoſum, a ligature on the penis, &c.

We ſhall not repeat what has been already ſaid reſpecting the ſymptoms of a retention of urine originating from affections of the rectum. The impediment to the evacuation will be known to depend upon one of the cauſes above ſpecified, if the patient could make water quite freely before ſuch cauſe exiſted, and no other reaſon can be aſſigned for the obſtacle. Of courſe, the radical cure of all ſuch retentions of urine can only be accompliſhed by curing the other diſeaſe, on which they are dependent. However, until the cauſe can be obviated, the urine muſt be drawn off with a catheter. Elaſtic gum catheters uſually enter more eaſily than thoſe made of ſilver, as, by their flexibility, they accommodate themſelves better to any deviation of the urethra from its ordinary direction. Deſault particularly recommended a catheter of middling ſize to be ſelected, and introduced armed with its ſtilet, until it ſtopped in the canal; when he adviſed withdrawing the ſtilet for about an inch, in order to leave the beak of the inſtrument quite free, ſo that it might follow the curve of the urethra. Then the tube and the ſtilet are to be puſhed further into the canal; care being taken,

taken, however, to keep the ftilet drawn back fome diftance from the extremity of the inftrument. By thefe precautions, fays Default, the catheter may always be got into the bladder. Should the introduction prove neither painful nor difficult, Default thought it would be better not to annoy the patient by making him continually wear the inftrument, unlefs its prefence in the urethra were effentially neceffary to deftroy the caufe of the retention of urine, as it would be in the inftance of urinary fwellings.

16. *Retention of Urine from Difeafe of the Proftate Gland.*—As Default remarks, it would be fuperfluous to endeavour to prove by examples the reality of this fpecies of retention of urine. If the fact were not eftablifhed by a multitude of obfervations, we fhould be convinced, by adverting to the relation of the proftate gland with the commencement of the urethra, and underftanding how this canal is only compofed of a delicate membrane, that the gland could not be affected with fwelling, without leffening in fome degree the tube which it embraces.

An enlargement of the proftate gland may depend on inflammation, abfceffes, calculi formed within its fubftance, a varicofe fwelling of the veffels which furround it, or on a fcirrhous tumour and induration of it.

When a retention of urine arifes from inflammation of the proftate, it makes its attack very fuddenly, and rapidly increafes. The patient at firft complains of a fenfe of heat and weight about the perineum, and very foon afterwards of a continual throbbing pain about the neck of the bladder. This pain is feverely increafed, when the patient goes to ftool; and he is afflicted with tenefmus, and frequent inclination to make water. He feels alfo as if a large mafs of excrement filled the extremity of the rectum, and were ready to come out. When the finger is introduced into the bowel, the projection of the proftate can be felt at its anterior part. J. L. Petit adds another fign of a fwelling of this gland: "Si l'on eft curieux de voir les malades aller à la felle, lorfqu'ils rendent des excrémens durs, on trouvera que la partie intérieure du boudin formé par les matières fécales, fera creufée, comme ayant paffé fur la faillie, que forme la proftate dans la partie antérieure du rectum." Bichat conceives, however, that fuch an appearance may be obliterated in the paffage of the excrement through the fphincter ani. When the patient attempts to make water, it is a long while before the firft drops come out; and if he fhould now increafe the efforts, he makes an additional impediment, by pufhing the fwollen proftate more and more againft the neck of the bladder, the aperture of which becomes ftopped up, and no water can be voided, until the efforts are leffened. The ftream of urine is fmaller, and the pain arifing from its expulfion more acute, in proportion as the inflammation of the proftate is more confiderable. We may alfo add, as a particular fymptom of this fort of retention of urine, that if an attempt be made to introduce a catheter, it paffes without the leaft refiftance as far as the proftate, where it ftops, and caufes great pain. The pulfe is hard and frequent; there is much thirft; and all the ufual fymptoms of fever prevail.

This kind of retention of urine, as well as all thofe which originate from an enlargement of the proftate gland, or other obftructions in the canal, are, according to Default, generally more dangerous than other cafes, which merely depend upon the weaknefs of the bladder, and in which there is very little rifk of this vifcus giving way.

When the urethra is free from obftruction, the urine, after diftending the bladder to a certain degree, generally oozes through that canal; and the patient may live in this condition for years, without any alarming confequences. But the cafe is different, when the retention of urine depends upon any ftoppage or ftricture in the urethra. The urine does not then partially efcape; this fluid ftagnates in the bladder; the diftention increafes; and if fpeedy relief be not afforded, that vifcus inflames and floughs, and a perilous effufion of its contents enfues.

In the retention arifing from inflammation of the proftate, the indication is obvious: it is to ufe every poffible means of refolving the inflammation. Venefection, leeches to the vicinity of the anus, the warm bath, emollient clyfters, and poultices, are the remedies which feem moft eligible. Thefe muft be affifted with a regimen ftrictly antiphlogiftic.

It muft be confeffed, however, that the efficacy of thefe means is often too flow, and the fymptoms too urgent, to allow us to wait for the urine to flow of itfelf. Frequently, alfo, the tone of the bladder is fo much weakened by the diftention, that this organ cannot expel its contents. The catheter muft then be employed; but the contraction of that part of the urethra which runs through the proftate, fometimes renders the introduction of this inftrument difficult, and always very painful.

According to Default, a large catheter generally anfwers better than a fmall one, and it may either be of filver or elaftic gum. The latter, though the beft for the purpofe of being kept in the paffage, has not always fufficient firmnefs to get through the obftruction in the canal, not even with the aid of the ftilet. In this refpect, a filver catheter is fometimes preferable. But whatever may be the kind of catheter employed, it generally paffes as far as the proftate with perfect facility, where it is ftopped, not only by the narrownefs, but alfo by the new curvature, of the paffage: for the proftate cannot be enlarged, without pufhing forwards and upwards, or to one fide, that portion of the urethra behind which it is fituated. This circumftance ought never to be forgotten, in regulating the length and direction of the beak of the catheter, which fhould alfo be longer, have a more confiderable curvature, and be more elevated, at the time of its introduction, than in other cafes of obftruction in the urethra.

In fwellings of the proftate gland, Mr. Hey has particularly pointed out one advantage which belongs to elaftic catheters, *viz.* that their curvature may be increafed while they are in the urethra. This gentleman was introducing an elaftic gum catheter in a patient, whofe proftate gland was much enlarged, and finding fome obftruction near the neck of the bladder, he withdrew the ftilet; in doing which, he accidentally repreffed the tube, which then went into the bladder. In fact, he found that the act of withdrawing the ftilet increafes the curvature, and lifts up the point of the catheter. Pract. Obf. in Surgery, p. 399. edit. 2.

After being tolerably certain, fays Default, that the end of the catheter correfponds exactly to the direction of the urethra, and that the obftacle to its entrance into the bladder only depends upon the narrownefs of the paffage, we may, without being too fearful of making a falfe paffage, forcibly pufh forward the catheter. This inftrument will certainly rather dilate a canal, that already exifts, than form a new paffage for itfelf. Default confeffes, however, that this plan would be attended with great danger in the hands of young inexperienced furgeons; and he adds, that it is only fit to be practifed by thofe, who, combining great experience in the ufe of the catheter with an accurate knowledge of the different curvatures of the urethra, have at length attained that degree of fkill, which never lets them lofe fight of the fituation and direction of the beak of the catheter. For, fays he, if, while the inftrument is forced forward, the beak fhould be inclined too low, or to one fide,

ſide, &c. a falſe paſſage would inevitably be occaſioned by a laceration of the membranous portion of the urethra; an accident which is always of a ſerious nature, increaſing the inflammation of the proſtate, and rendering the introduction of the catheter more difficult. This bold practice, ſuggeſted by Deſault, is frequently purſued by Boyer and Roux, and ſometimes in this country by Mr. A. Cooper, Mr. Pearſon, &c. (See Croſs's Medical Sketches of Paris.) We have indeed heard, that Mr. Thomas Blizard, and ſome other ſurgeons in London, always force their way through the proſtate gland with a conical ſilver catheter, in preference to puncturing the bladder, when no inſtrument can be introduced through the urethra in a gentle manner. The urine afterwards paſſes through this ſort of falſe paſſage, ſeemingly as well as through the natural one.

We have not, however, brought our own minds to think that much good is ever likely to reſult from this exertion of violence in the urethra: therefore, when the caſe is urgent, and no catheter can be introduced through the natural canal, we ſhould prefer puncturing the bladder, which, in theſe caſes, ſhould always be done above the pubes. See Paracentesis *of the Bladder*.

Notwithſtanding the many examples of the ſucceſs that has attended this operation, the proceeding, as Deſault obſerves, has its dangers; and, conſequently, it ſhould never be reſorted to, before repeated unavailing attempts have been made to get a catheter into the bladder; nor before a trial has been made, whether a bougie left in the paſſage a few hours will not bring on an evacuation of the urine; an event which has often happened, even though the inſtrument did not paſs beyond the obſtruction. Puncturing the bladder, in ſuch caſes, ſhould alſo never be determined upon, without a previous conſultation with another practitioner, eſpecially if one be at hand, who has had greater experience in the uſe of the catheter.

When a catheter has been introduced, ought it to be left in the bladder, or withdrawn, after the diſcharge of the urine? Its preſence no doubt will increaſe the irritation about the neck of the bladder; but, on the other hand, if it be taken out, the ſurgeon may not be able to introduce it again. No general precept, ſays Deſault, can be laid down on this point. The courſe which the practitioner will purſue muſt depend upon the difficulty he has experienced in getting the inſtrument into the bladder, and upon the confidence which he may have in his own ſkill, and which is deduced from conſtant ſucceſs in analogous inſtances.

According to Deſault, when an abſceſs follows inflammation of the proſtate, the body of the gland itſelf does not ſuppurate, but only the ſurrounding parts, and the cellular ſubſtance, which connects its lobes together. This, at leaſt, was what was obſerved in examining ſeveral dead ſubjects, who were publicly opened in the amphitheatre of the Hôtel-Dieu. When the ſymptoms of inflammation have laſted a week, and all this time have continued to increaſe; when, after this period, they have abated a little, and then become violent again; and when the febrile ſymptoms get worſe in the evening, and have been preceded by ſhiverings; there is reaſon to ſuſpect the formation of matter. It cannot be known whether the pus is collected in one particular place, or diffuſed. When the matter is external to the gland, the caſe is leſs ſerious than when it occupies the cellular ſubſtance connecting the lobes. According to Deſault, the latter form of the diſeaſe ſeldom gets well. There are no peculiar ſymptoms which denote it; the matter does not readily make its way outward; and the ſtate of things is not clear enough to admit of an inciſion being made. Beſides, Deſault doubted whether an inciſion could be of much uſe, ſince it would probably only let out the matter in its vicinity.

Things are different when the pus is collected in one place, and is more ſuperficial. If ſituated between the gland and neck of the bladder, it will often ſpontaneouſly burſt into this viſcus, or it may be let out with the point of the catheter. It will then either be diſcharged through the inſtrument, or come away with the urine. Should the abſceſs lie near the rectum and perineum, and admit of being diſtinctly felt, a free opening would expedite the cure.

In all theſe caſes, the uſe of the catheter is requiſite, in order to let out the urine; and as the inſtrument muſt be left in the paſſage ſome time, one made of elaſtic gum is to be preferred.

When the abſceſs burſts of itſelf, either into the urethra or bladder, the catheter muſt be kept in as long as pus continues to be diſcharged with the urine. In the latter caſe, however, Deſault chiefly uſed the inſtrument for the purpoſe of throwing mucilaginous injections into the bladder, which many ſurgeons would not conſider neceſſary.

Morgagni has taken notice of the retentions of urine ariſing from the preſence of calculi in the proſtate gland. The nature of theſe concretions we have already deſcribed in a preceding article. See Urinary *Calculi*.

Calculi alſo ſometimes form after lithotomy, when the outer part of the wound heals ſooner than the bottom. A kind of urinary fiſtula then forms; and as the extraneous ſubſtance is conſtantly expoſed to the contact of freſh urine, it may increaſe to a very large ſize. The diagnoſis of proſtatic calculi is ſeldom very clear. A retention of urine, and an impediment to the emiſſion of the ſemen, are only ſymptoms which are common to ſeveral other affections of the proſtate gland and urethra. When the finger is introduced into the rectum, the gland may indeed be felt to be enlarged, but the nature and cauſe of ſuch enlargement cannot in general be diſtinguiſhed. In one inſtance, however, lately recorded by Dr. Marcet, the calculi could be plainly felt through the coats of the rectum, and a propoſal was made to extract them by an inciſion in that ſituation; but the patient did not accede to ſo judicious a meaſure. (Med. and Chem. Hiſt. of Calculous Diſorders, Lond. 1817.) When a calculus projects from the proſtate into the urethra, the end of a ſound will ſtrike againſt it; but then it can rarely be known whether the extraneous ſubſtance may not be a calculus that has paſſed out of the bladder into the urethra, or lies cloſe to the neck of this viſcus.

Whether the caſe be of one deſcription or the other, however, the treatment ſhould be the ſame; *viz.* the calculus ſhould be extracted by an inciſion, reſembling that practiſed in the lateral operation.

Another ſpecies of retention of urine is that produced by a conſiderable varicoſe affection of the veſſels ſurrounding the proſtate gland, which part is alſo generally ſomewhat enlarged. In this caſe, the water ſhould be drawn off with an elaſtic gum catheter, which ſhould be kept in the urethra; and a large inſtrument is to be preferred to a ſmaller one. For an account of the ſymptoms of this caſe, we muſt refer to Deſault's Œuvres Chir. t. 3. p. 234. The portion of the urethra which paſſes through the proſtate, is afterwards to be gradually dilated with bougies or elaſtic catheters, which are to be worn a long while, and cleaned and changed at proper intervals.

A ſcirrhous induration and enlargement of the proſtate gland form another very common diſeaſe in old ſubjects. The ſize and hardneſs of the gland are ſaid to vary conſiderably, according to the duration of the complaint. It has often been found as hard as a cartilage; more commonly its ſtruc-

ture presents an appearance as if filled with a firm tough lymph. Sometimes the part is two or three times as large as natural, and J. L. Petit once saw it as large as the fist. In some instances, only a part of it is scirrhous; in others, the whole of it is thus affected. The hardened gland can be felt in the rectum, and the examination does not give much pain.

A retention of urine is an ordinary symptom of a scirrhus of the prostate; the catheter is also here necessary, and the introduction of it is often attended with greater difficulty than in other affections of this gland. As the induration of the part does not allow it to yield, small catheters are better than those of large size. It also frequently happens, that considerable force must be used; and as this cannot be done with elastic catheters, a silver catheter, of the size used for children, was recommended by Desault. The moderns sometimes employ a conical silver catheter, as we have already noticed. Sometimes, however, no instrument can be introduced unless it be rotated, in doing which it is essential to recollect that the urethra in these cases makes a very sudden turn upward before it terminates in the bladder.

After the silver catheter has been worn three or four days, the canal is usually freer, so that one made of elastic gum will now admit of being passed. This last must in general be continually employed for four or five weeks, and in the mean while attempts should be made to check the disease in the prostate by the exhibition of mercurials, conium, &c. Suppositories of hemlock have also been particularly recommended. Some of Mr. Hunter's remarks on this complaint will be found in the article PROSTATE *Gland, Disease of.*

17. *Retention of Urine brought on by Strictures.*—This is another case, which we deem necessary to notice in this work. The common nature, most frequent situation, and different methods of treating strictures in the urethra, have been already explained. (See URETHRA, *Strictures of.*) Persons who have been long subject to strictures in the urethra, but who are still able to void their urine in a small stream, are liable, from accidental causes, to have a complete retention, and are incapable of expelling the contents of the bladder. This arises in some cases from the diameter of the urethra being still further diminished by attacks of inflammation, but more frequently from the spasmodic state of the urethra and muscles of the perineum. The same effect may be produced by such patients retaining their urine too long after the first desire to void it is experienced. It happens not unfrequently, that the permanent stricture may be of such a nature, as not to admit of the introduction of any instrument into the bladder, even under the most favourable circumstances. A spasmodic state of the urethra, as Mr. Earle has further observed, would not facilitate such attempts. Other cases again occur, in which perhaps an instrument can be passed, when the urethra is in a more tranquil state, but where it would be highly injudicious, and often impracticable to introduce such instruments under circumstances of irritation, by which attempts the spasm would be increased, and the patient rendered liable to returns of retention, even were we to succeed in the first instance.

In all such cases, it is, as Mr. Earle remarks, highly desirable to overcome the retention by other means than the introduction of instruments. For this purpose purgatives, general and local bleeding, warm-baths, the tinctura opii, and tinctura ferri muriatis, are commonly resorted to. With respect to purgatives, their action necessarily requires more time than, from the urgency of the symptoms, is frequently admissible. The other remedies are highly useful, and will frequently fulfil every indication. Sometimes, however, they are unavailing, and we are compelled to resort to operations for relieving the distended bladder. Mr. Earle then proceeds to recommend the use of tobacco in the form of an enema, either of smoke or the decoction, which he found, in some cases which are detailed, a powerful and expeditious means of relieving the retention of urine, when other more common remedies had failed. See Medico-Chir. Transf. vol. vi. p. 84, &c.

18. *Retention of Urine produced by foreign Bodies in the Urethra.*—Most of the foreign bodies, occasionally met with in the bladder, may cause a retention of urine, when they are lodged and stopped in the urethra. Thus, calculi, bougies, &c. fixed in this canal, may become obstacles to the transmission of the urine through it. The means which have been recommended for promoting the removal of such extraneous substances are numerous. Some advise oily injections to be thrown into the urethra, in order to make its surface more slippery, while others think it better to dilate the canal as much as possible with catgut bougies. The ancients proposed the trial of suction. But, says Desault, these and other similar means are ineffectual, when the foreign body is closely embraced by the urethra. In this case, he observes, if the extraneous substance cannot be pushed forward with the fingers applied externally, an endeavour may be made to extract it with the forceps, invented for the purpose by Mr. Hunter, and which are contained in a cannula. When, however, the foreign body is too large to be got out in this manner, it must be extracted by an incision. The wound of the operation will afterwards be found to heal up very well, if care be taken to keep an elastic catheter in the urethra, in order to prevent the urine from coming into contact with the cut part. There has lately been published a case of calculus in the urethra, attended with dysury, where almost instantaneous relief was obtained from the exhibition of an enema of tobacco. The patient soon felt a strong desire to void his urine, and "upon making the attempt, a large calculus came rolling along the urethra, with complete relief of all his complaints." See Edinb. Med. and Surg. Journal, vol. xii. p. 373.

URINE, *Suppression of,* in *Animals,* a disease arising from the want of making water in consequence of some affection of the parts concerned in passing it. The complaint is caused, according to some, either by inflammation obstructing the functions of the kidneys, or by the ureters being obstructed by stones, small gravel, or other such foreign matters, or when affected with any numbness, or other defect, that may disable them in their office of separating the urine from the blood. In this last case, the bladder is, for the most part, empty, so that the animals make no motions to pass urine, but stand in the straddling manner, as in other disorders of the urinary passages, when the bladder is full or the urethra inflamed; this is particularly the case in the horse kind of animals; and if they continue a few days in this condition, without the secretion of urine, their bodies are liable to swell to a very great degree, and they, in this sort of animals, often break out universally in blotches and die, unless speedy relief be afforded. Where the disease is caused by strangury, it is commonly attended with a partial, if not a complete suppression of urine, but in general without much appearance of fever, though there are signs of uneasiness and irritation with loss of appetite. The disorder may be produced from different other causes, as from whatever has a tendency to affect the parts about the neck of the bladder, such as certain articles of food, blows, a spasmodic state of the muscles inducing contraction in them, and some others.

In the cure of the disease, it will first mostly be necessary, in cases where there is a tendency to inflammation, to take away a few pints of blood in proportion to the state of the affection

affection and the ſize of the animal. Where horſes are ſubject to an obſtruction in the paſſages of the urine from calculi, but which is rarely the caſe, the proper method of cure is, according to ſome, to begin with ſtrong diuretic remedies, in connection with ſtimulating clyſters; and if there ſhould be any ſuſpicion of inflammation either in the kidneys or ureters, it may be proper to bleed in a plentiful manner, to the amount in ſome caſes of three or four pints. And balls compoſed of the following ingredients are likewiſe adviſed to be given and repeated two or three times the firſt day, and as often the next, as in ſuch caſes no time is to be loſt; for, if the horſe or other animal does not ſtale or paſs urine in the courſe of thirty hours, the caſe is moſtly deſperate: Juniper-berries in fine powder, an ounce; ſocotrine aloes and nitre in powder, each ſix drachms; oil of turpentine, three drachms, and of amber and juniper, each two drachms; liquorice powder and treacle, ſufficient quantities to form a maſs of ſuitable conſiſtence for being divided into two balls, to be given at one time as above.

At the ſame time a clyſter prepared in the following manner may be thrown up with great benefit: Barbadoes aloes, two ounces; the ſame quantity of turpentine, beaten up with the yolks of eggs; half an ounce of powdered jalap; four ounces of nitre, and juniper and bay berries bruiſed, each a ſmall handful; infuſed in two quarts of a decoction of marſhmallows, to which is then added a pint of linſeed oil.

Where theſe remedies fail in removing the complaint, the horſe or other animal's loins are adviſed to be rubbed with a mixture of oil of turpentine and of amber, and to lay a cataplaſm over the ſmall of the back and kidneys, formed of pounded garlick, muſtard-ſeed, camphor, and ſoap. This, it is thought, may prove beneficial as a ſtimulant to the kidneys, in caſe they happen to be deficient in nervous influence; and that, in caſe of inflammation, the ſame remedy may act as a bliſter without the danger of producing a ſtrangury, and in that way too be of ſervice. It ſhould be ſpread on a coarſe flannel cloth doubled, bound on with a broad woollen roller, and renewed once in two days, until the horſe or other animal comes to ſtale or paſs urine freely: calomel too in the quantity of a drachm and a half or two drachms, made up into a ball, and repeated every two days, once or twice, may be of uſe in caſes where the kidneys are not inflamed; after which the horſe or other animal may be purged gently where it is neceſſary.

In caſes where the ſuppreſſion of urine is cauſed by or attended with ſtrangury, after bleeding and opening the bowels when neceſſary, a ball, compoſed in the manner directed below, and given in a pint of the decoction, once or twice in the day, as there may be occaſion, will often be found very beneficial: pure opium in powder, half a drachm; camphor rubbed into a powder, three drachms; nitre in powder, half an ounce; common ſoap, ſix drachms; balſam capivi ſufficient to make them into a ball.

In preparing the decoction, four ounces of linſeed and the ſame quantity of mallow root bruiſed, with three ounces and a half of gum arabic, ſhould in the whole be boiled for a few minutes in three pints of water, and the liquor then ſtrained off for uſe as above.

Wet cloths frequently ſqueezed out of a warm decoction of chamomile, and other ſimilar herbs and flowers, may often be applied with great benefit to the parts between the legs, near to the neck of the bladder.

The animals ſhould have maſhes of bran, malt, and other ſuch matters, occaſionally given to them, with warm water or oatmeal gruel for drink.

By theſe means, affections of this ſort may commonly be ſpeedily removed without any great difficuity.

Urine, *Chemical Properties of.* Perhaps no animal product has more attracted the attention of chemiſts than the urine, not only on account of its ſuppoſed connection with diſeaſes, but alſo on account of its compound nature, and ſingular chemical properties. The older chemiſts, Brandt, Kunckel, Boyle, &c. were led to examine its nature chiefly on account of the phoſphorus which they extracted from it. Since their time others have examined it with different and various views, among whom may be mentioned Boerhaave, Haller, Margraff, Pott, Rouelle jun., Cruickſhanks, Fourcroy and Vauquelin, Prouſt, Klaproth, and more lately Berzelius, who has given by far the beſt and moſt rational account of this fluid which has yet been publiſhed.

Freſh human urine differs conſiderably in its appearance, according to the ſtate of a perſon's health, his food, or the period at which it has been voided. In general, the urine of a perſon in health, voided in the morning, is a tranſparent liquid of a light amber colour, an aromatic odour, reſembling that of violets, and a diſagreeable taſte. When it cools, the aromatic ſmell leaves it, and is ſucceeded by another, well known by the name of *urinous*. In two or three days this is ſucceeded by another, which has been compared to that of ſour milk. This alſo gradually diſappears, and is finally ſucceeded by a fetid alkaline odour.

Freſh urine, juſt voided, reddens turnſole paper, and therefore contains a free acid. The ſpecific gravity of urine, according to Mr. Cruickſhanks, varies from 1.005 to 1.033. According to the recent experiments of Dr. Scudamore, the ſpecific gravity of *healthy* urine lies between 1.010 and 1.015. The ſpecific gravity of morbid urine, according to the ſame author, is frequently as high as 1.030, and occaſionally as high as 1.040.

We ſhall give the reſults of Berzelius's analyſis of this fluid, and afterwards make ſome remarks upon the more important ingredients contained in it. According to this accurate chemiſt, 1000 parts of urine are compoſed of

Water	933.00
Urea	30.10
Sulphate of potaſh	3.71
Sulphate of ſoda	3.16
Phoſphate of ſoda	2.94
Muriate of ſoda	4.45
Phoſphate of ammonia	1.65
Muriate of ammonia	1.50
Free lactic acid Lactate of ammonia Animal matter ſoluble in alcohol, and uſually accompanying the lactates Animal matter inſoluble in alcohol Urea, not ſeparable from the preceding	17.14
Earthy phoſphates, with a trace of fluate of lime	1.00
Uric acid	1.00
Mucus of the bladder	0.32
Silex	0.03
	1000.00

Of this analyſis, Berzelius remarks, that "the relative proportions of the ingredients probably vary independently of diſeaſe. I believe, however, that in urine they are never very different, unleſs from pathological cauſes, which materially affect the health."

Of theſe numerous ingredients we ſhall briefly ſpeak of the

the acids only of the urine, having treated at length of *urea* in its proper place.

The acids of the urine may be confidered as of two kinds, thofe peculiar to it, and generated in the act of fecretion; and thofe common to it and the blood, and which of courfe pre-exifted in that fluid. In the firft clafs are comprifed the fulphuric acid, the uric acid, and occafionally the benzoic and carbonic acids; in the fecond, the phofphoric and lactic acids, which appear to be more abundant in the urine than the blood, and confequently may be fuppofed to be formed in part in the kidneys alfo; in the third, the muriatic and fluoric acids which appear to pafs from the blood to the urine without any increafe from the kidney. As by the laws of chemical affinity thefe acids will unite with any alkaline bafe that may be prefent, and faturate themfelves with it in the order of the force of their refpective affinities, it muft follow, as juftly obferved by Berzelius, that when the quantity of alkali is infufficient to faturate all the acids prefent, the weakeft acids muft be thofe that will remain uncombined, and will confequently impart to the urine their peculiarly acid characters. Thefe therefore muft neceffarily be the lactic and the uric acids.

The *fulphuric acid* does not exift in the blood, but it is found in confiderable quantity in the urine. Rouelle fenior long ago pointed out this fact, but it feems to have been regarded by fubfequent chemifts rather as an accidental than as a conftant occurrence. Berzelius, however, has fhewn the contrary, and ftates that he has good reafon for believing that this acid is an effential conftituent of the urine. The fame excellent chemift alfo has fhewn that the whole of the fulphur contained in the blood is not acidified in the kidneys, but that a portion of it ftill remains in an unaltered though combined ftate in the urine.

The leading properties of the *uric* acid have been difcuffed under its proper head; we fhall therefore confine ourfelves here to a few circumftances connected with its formation and feparation from the urine. The red cryftalline depofit, or gravel, which occurs in urine that has been kept for a few days, confifts chiefly of uric acid united with the colouring matter of the urine, or, according to Berzelius, with ammonia. What is termed alfo the *pink*, or *lateritious fediment*, a fubftance frequently formed in derangements of the digeftive organs, and efpecially in gout, and which was formerly confidered a diftinct principle by Prouft, who named it the *rofacic acid*, has been lately fhewn to confift chiefly of uric acid, combined with colouring matter and foda.

The *benzoic acid*, according to Scheele, is fometimes found in the urine of infants. Berzelius, however, has never been able to detect it, and feems to doubt if it ever exifts in healthy human urine.

With refpect to the *carbonic acid*, Berzelius feems to doubt if it ever exifts in healthy urine, and fuppofes its occafional prefence to arife from the decompofition of urea. Dr. Marcet ftates that he has fometimes found traces of carbonic acid in the urine, and fometimes not; and concludes, "that the evolution of this gas from the urine, whether arifing from the prefence of uncombined carbonic acid, or from fome decompofition of the animal matter contained in that fluid, depends upon certain ftates of the body at the moment the urine is fecreted, rather than upon the introduction of the gafeous acid through the digeftive organs."

The *phofphoric acid*, for the reafons before mentioned, can hardly be ever fuppofed to exift in urine in the free ftate. Its falts, however, form very important ingredients of that fluid. What is termed *white gravel*, or *fand*, ufually confifts of the phofphate of magnefia and ammonia, and of the phofphate of lime, and are perhaps chiefly formed in the kidney.

To the *lactic acid*, and the peculiar animal matters which accompany it, Berzelius afcribes chiefly the acid properties, as well as the peculiar colour and fmell of the urine.

The *muriatic acid*, and its compounds, the muriates of foda and ammonia, exift in the urine, (more efpecially the muriate of foda,) in confiderable quantity. The muriate of foda is probably never a product of fecretion, but derived from the blood. The origin of the muriate of ammonia is more obfcure.

The prefence of a fmall portion of the *fluoric acid* in urine in combination with lime has been demonftrated by Berzelius; but the exiftence of this principle, as well as of *filex* in the urine, refts at prefent, we believe, upon his authority alone.

The urine is not only liable to be much modified by difeafe, but from the fame caufe occafionally contains fubftances which never exift in it in a healthy ftate. The principal of thefe are albumen, faccharine matter, and oxalic acid, all which, as well as others, probably depend either upon a fufpenfion or perverfion of the fecreting powers of the kidney.

Thus the albumen feems to be derived at once from the blood. The faccharine matter, as ftated under UREA, appears to be formed by fome unknown procefs from that fubftance, while the oxalic acid is probably derived from the fame fource.

The above obfervations apply to the human urine; we come now to make a few remarks upon the urine of other animals; a moft extenfive field of refearch, but which has not at prefent been much inveftigated.

Urine of the Lion and Tiger.—The urines of thefe animals, according to Vauquelin, clofely refemble one another, and likewife bear fome analogy to the human urine; they differ from it, however, in the following effential points: they contain no uric acid, nor any combination of that principle, as might have been expected from the food on which thefe animals live. They contain, however, a great proportion of urea, though very little muriate of foda. They have a peculiar fetid fmell, which is derived, in part, probably from the ammonia developed from the decompofition of the urea. This fmell is well known to be common to the urine of all the feline animals, and may in every inftance be fuppofed to be owing to a fimilar caufe.

The urines of the *horfe* and *cow* do not differ much from one another, according to the fame chemift. Both become muddy in cooling; both are alkaline, and contain a large proportion of carbonate of lime, benzoic acid, and urea, but no uric acid. One thoufand parts of the urine of the horfe, according to Fourcroy and Vauquelin, are compofed of

Water and mucus	940
Urea	7
Carbonate of lime	11
Benzoate of foda	24
Carbonate of foda	9
Muriate of potafh	9
	1000

The urine of the *camel* has been examined by Rouelle. Its odour refembles that of the cow. Its colour is that of beer; it is not mucilaginous, and does not depofit carbonate of lime. It is alkaline, and contains the carbonate, fulphate, and muriate of potafh, and urea. Mr. Brande, who has fince

ſince examined this fluid, thought he diſcovered in it traces of uric acid.

The urine of the *beaver* has been examined by Vauquelin. It bears a ſtrong reſemblance to the urine of herbivorous animals in general. It contains carbonate of lime, held in ſolution by exceſs of carbonic acid; alſo benzoic and acetic acids, urea, muriate of ſoda, and ſulphate of potaſh, but no uric acid nor phoſphates. It contains, however, muriate of ammonia, and carbonate and acetate of magneſia, according to the ſame chemiſt, though we think the exiſtence of the laſt principle is doubtful. The ſpecimen examined by Vauquelin alſo afforded diſtinct traces of the colouring principle of the willow bark, on which this animal feeds.

The urine of the *rabbit* has been examined by the ſame chemiſt, who found this, as well as the urine of the *guinea pig*, to reſemble very cloſely the urines of the herbivorous quadrupeds above deſcribed.

The ſame indefatigable chemiſt alſo, aſſiſted by Fourcroy, has examined the urine of *domeſtic fowls*, in which they found uric acid, a fact which has been confirmed by ſucceeding chemiſts. They alſo found the ſame acid in great abundance in the excrements of a South-ſea bird, called *guano*.

Laſtly, Dr. Prout has given the following analyſis of the excrements, or urine, of the *boa conſtrictor*. One hundred parts were found to conſiſt of

Uric acid	90.16
Potaſh	3.45
Ammonia	1.70
Sulphate of potaſh, with a trace of muriate of ſoda	.95
Phoſphate of lime Carbonate of lime Magneſia	.80
Animal matter, conſiſting of mucus, and a little colouring matter	2.94
	100.00

The uric acid, in this inſtance, was in combination with the potaſh and ammonia, and was eaſily obtained in a perfectly pure ſtate by the uſual proceſſes.

Hence it appears that the urine of quadrupeds agrees with the human urine, in containing urea; but materially differs from it, in being without phoſphoric or uric acid, and in containing an exceſs of carbonic acid: while the urines of birds and ſerpents ſeem to contain an exceſs of uric acid, and a deficiency of the other ingredients exiſting in the human urine.

Urine, in *Agriculture*, the ſaline fluid ſecreted from the blood of animals by the kidneys, and diſcharged by the canal of the urethra, which is highly uſeful as manure in different caſes, in promoting vegetation, and increaſing the fertility of land. It is, indeed, in this laſt way, of great uſe, in improving moſt ſorts of ſoil. Beſides its value in other intentions too, Columella has aſſerted, that old urine is excellent when applied to the roots of trees. Hartlib alſo has much commended the Dutch for preſerving the urine of cows as carefully as they do the dung, for enriching their lands.

This is therefore a fluid which is capable of being employed with great ſucceſs and benefit both on meadow and on arable land, and which affords uncommon fertility and improvement to both in many caſes. In the former caſe, the beſt time for ſprinkling or applying the liquid over the land, is ſuppoſed by ſome to be during the winter months, when the rains will have the moſt power in waſhing the fertilizing parts of it into the ſoil; or, the land may be ſprinkled over with it, early in the ſpring, juſt before it is laid or ſhut up for hay; becauſe no cattle will touch the graſs ſo long as the ſaline matters adhere to the blades of it. Another circumſtance which is neceſſary to be attended to in ſuch caſes, in order to make the moſt of this very valuable fluid manure, is, that it be carried out to the meadow and paſture-grounds that are intended to be dreſſed with it, in a dry time, as the urine and farm-yard liquor in the reſervoirs is at ſuch periods the moſt ſtrongly impregnated with ſaline and other matters, as may be known by the deep brown or blackiſh colour that is preſent. All ſuch reſervoirs or ponds, as are appropriated for the reception of it, ſhould conſtantly be kept, in ſome meaſure, in a ſtate of readineſs for the purpoſe, at ſuch ſeaſons; and the lands may be ſprinkled or moiſtened as often as occaſion may render it neceſſary or proper.

The practice of moſt modern farmers in reſpect to preſerving urine is, it is ſaid, as oppoſite as poſſible; for they not only ſuffer that of their cattle to flow away, but have generally their dung-heaps ſo ſituated that they are drenched and impoveriſhed by rain, which conveys their moſt valuable ingredients into the next river. The more heavy and cumberſome materials, which the water can neither diſſolve nor ſweep away, are frequently, it is ſaid, alone reſerved, to be beſtowed, at a great expence, on the defrauded land.

It is conceived by a writer in the fourth volume of Communications to the Board of Agriculture, that the quantity of moſt valuable manure which may thus be carried away, is much greater than is perhaps imagined. Lately, the writer obtained more than half an ounce of a dry fetid ſubſtance from one quart of human urine. Suppoſing the urine of cattle, it is ſaid, to be equally productive, every hogſhead of it which flows out of a farm-yard, without even any impregnation from the dung-heap, carries away ſeven and a half pounds of ſolid matter. This ſhould induce farmers in all caſes to waſte liquors of this ſort as little as poſſible, and to convert them as much as can be to the improvement of land, and earthy ſubſtances as manure, for applying upon it.

It is remarked that urine is very liable to change, and to undergo the putrefactive proceſs; and that that of carnivorous animals does it more rapidly than that of the graminivorous kind. That in proportion as there is more gelatine and albumen in urine, ſo in proportion does it putrefy more quickly. That the ſorts of urine that contain moſt albumen, gelatine, and urea, are the beſt as manures; and that all urine contains the eſſential elements of vegetables in a ſtate of ſolution. That as during the putrefaction of urine, the greateſt part of the ſoluble animal matter that it contains is deſtroyed, it ſhould, of courſe, it is ſaid, be uſed as freſh as poſſible; but that if not mixed with ſolid matter, it ſhould be diluted with water, as when pure it contains too large a quantity of animal matter to form a proper fluid nouriſhment for abſorption by the roots of plants. The ancients had, however, a notion of uſing urine ſtale: but of mixing it with rich earthy matters, which is probably the beſt and moſt economical mode of applying it, they had, it would ſeem, no idea.

Putrid urine, it is ſaid, abounds in ammoniacal ſalts; and that though leſs active than freſh urine, is a very powerful manure.

In ſome northern diſtricts very great improvement is produced on graſs land by the application of urine and dung-liquor in the beginning of the autumn, as about November. The fluid is conveyed and applied to the land by means of a rum-

a rum-puncheon, which is mounted on wheels, being filled by large pails with long handles. Two persons, a man and boy, are employed in the work. One puncheon full is capable of doing forty-six rods (of seven yards) forward, and three yards in breadth. In this way, it is very readily and conveniently made use of, when applied in the liquid state. The writer of the Agricultural Report of the County of Peebles observes, that the urine of cattle, until of late too much neglected, is now more attended to: it is collected by earth laid down to absorb it, as well as the liquids that run off from the dungsteads, or it is received into a pit furnished with a pump. Some collect it in the first manner, and apply it to the land by putting it into a puncheon mounted as above, and furnished at the hindermost end with a pipe, terminating in a large rose, somewhat like that of a watering pan. It is drawn over the field by one horse, and the urine from the rose besprinkles to the breadth of nine feet, so that an eighteen-feet ridge is done in the going and returning of the carriage. It is observed, too, that as urine is of a scorching quality, it is unsafe to apply it to any growing crop, in great heat or drought; so that, in general, it is unadviseable so to apply it after the month of May. That it ought not to be applied to any land in winter, from its being so easily washed away by rains; and never on wet lands, earlier than the month of March; and then only in dry weather. That it may be laid on fallow, at any time when it is dry enough to absorb it readily. That, in dry warm weather, it is advantageously thrown over dunghills, especially those of the compost kind.

Notwithstanding these remarks on the great use of urine, it is stated in the seventh volume of the Bath Letters and Papers, that an attentive and diligent farmer took the trouble one year to carry out all the stable liquor *alone*, but without observing any *good* effects from it, and that another person was known to him who had done the same thing without any better success. The time, manner, or sort of land to which it was applied are not, however, mentioned, which would probably have explained the reason of its want of success in such cases.

URINE, *Salt of.* See *Fusible* SALT.

URINOUS SALTS are the same with what we otherwise call *alkaline salts*, or alkalies.

There are two kinds of urinous salts, the one *fixt*, the other *volatile*. The fixt prevail in plants, and the volatile in animals.

They are called urinous, in respect of their taste and smell, which bear some resemblance to those of urine.

URIPA, in *Geography*, a town of Peru, in the diocese of Cusco; 120 miles W.N.W. of Cusco.

URIQUE, a town of New Mexico, in the province of Cinaloa; 120 miles N.E. of Cinaloa.

URISAL, a town of Sweden, in the province of Upland; 6 miles N. of Stockholm.

VRISHADWAJA, a name of the Hindoo deity Siva. It is a compound word, meaning he who rides a bull; this animal being the vehicle on which that deity rides.

VRITRA, a demon, according to Hindoo legends, slain by their god Indra, regent of the firmament, who is thence named Vritrahan. See INDRA.

URITANUS AGER, in *Ancient Geography*, a territory of Italy, mentioned by Appian and Velleius Paterculus.

URITH, in *Rural Economy*, a term sometimes used to signify the bindings of hedges in those of the staff and band or rise kind. See FENCE and HEDGE.

URITZ, in *Geography*, a town of France, in the department of the Lower Loire; 14 miles N.N.E. of Ancenis.

URIVES, in *Rural Economy*, a term sometimes applied to the nets which are used to catch hawks, and other similar birds of prey with, in different places.

URIUM, in *Ancient Geography*, a town of Hispania, in Bœtica, on the confines of Lusitania, belonging to the Turditani. Ptolemy.—Also, one of two rivers of Bœtica, between the Axas and the Bœtis.

URIUMKAN, in *Geography*, a river of Russia, which runs into the Arguna, N. lat. 51° 55′. E. long. 124° 15′.

URJUP, or URUP, one of the Kurile islands, distant from Shirpo Oi 25 versts. This island is larger than most of the others, being 200 versts long, and 20 broad. Its mountains are high, with bald heads; they are very steep, and about them are deep glens. On the north coast lie four small isles almost contiguous. In the vales, and beside the streams, a plain is occasionally seen; and in the valleys as well as on the mountains, and indeed over the whole island on the north and east sides, are high forests of birches, elders, the sorbus sylvestris, and sturdy rattans. On the shores and in the valley-plains the herbs shoot to an uncommon height. Considerable streams flow from the mountains into the sea, and yield a variety of fish. In the northern part, about the middle of the island, is an inland sea, which discharges its waters by a level stream into the ocean; which stream teems with fish. The island abounds with rats, and with red and white foxes. In the clefts of the mountains is found ore, such as copper pyrites mixed with quartz, sulphur pyrites as hard as steel, with quartz, and a poor copper pyrites in a calcareous gangue. This island is only frequented for taking the foxes. Tooke's Russ. vol. i.

URK, a small island in the Zuyder Zee; 11 miles E. of Enckhuyten.

URKEND, or UZKUND, or *Adercand*, a town of Turkestan; 90 miles N.E. of Toncat.

URKOK, a town of Bengal; 14 miles N. of Doesa.

URKONGE, or KORKANJE, or *Orkanje*, or *Urgentz*, a town of Asia, and capital of Charasm, on a branch of the Jihon, which runs into the lake Aral. In the year 1221, this place was besieged by the troops of Jenghiz Khan, and after an obstinate defence, and the death of the governor, the inhabitants set fire to their houses; those who remained after the slaughter which followed the surrender were condemned to slavery; 320 miles W.N.W. of Samarcand. N. lat. 42° 35′. E. long. 58° 30′.

URKUP, or YURKUP, a town of Asiatic Turkey, in Caramania, on the Kizil-ermuk; 10 miles W.S.W. of Tocat. N. lat. 38° 37′. E. long. 34° 18′.

URLINGFORD, a small town of the county of Kilkenny, Ireland; about 10 miles S.W. from Durrow.

URLIUTIUPSKOI, a fort of Russia, in the government of Kolivan, on the east side of the Irtisch. N. lat. 53° 36′. E. long. 75° 34′.

URMIAH, or URUMEA, a district of Persia, in the province of Azerbijan.—Also, an ancient city of the same province, the Thebarma of Strabo, and supposed birth-place of Zoroaster, situated on a noble plain, which is fertilized by the river Shar, and on the south-west of the lake to which it gives name. This town is distant 32 fursungs from Tabreez, and contains a population of 12,000 souls. It is defended by a strong wall and deep ditch, that may be filled with water from the river, and the vicinity produces wine and corn in abundance. It cannot boast of a single river of consequence. N. lat. 37°. E. long. 45° 40′.—Also, a lake generally believed to be the Spauto of Strabo, and Marcianus of Ptolemy, about 80 fursungs or 300 miles in circumference. The water is more saline than the sea, and it emits a disagreeable sulphurous smell, so that no fish can live in it. Some say that the surface is occasionally in-

 crusted

crusted with salt; but this is not always, if ever, the case. On one of the islands in the lake (for there are several) Holaku built a fortress, in which he secured the spoil he had collected during his conquests. The largest of these islands forms, in the dry season, a kind of peninsula, and is 25 miles in circumference; only inhabited by wild asses, deer, and many other kinds of game. In skirting the northern side of the lake, which is of an elliptic shape, we meet the town and district of Sa Bulagh (the cold stream). It is 12 fursungs from Maraga, and possessed by the Kurdish tribe of Meekree. *Maraga* (which see), supposed to be the Gamarga of Diodorus, has a spacious bazaar; is encompassed with a high wall, and is pleasantly situated in a low valley, at the extremity of a well-cultivated plain, opening to the lake, from which Maraga is distant 9 or 10 miles. The town has about 15,000 inhabitants, a glass manufactory, a handsome public bath, and near it an observatory built on the top of a mountain by Holaku, for his friend Naser a Deen, the most famous astronomer of his time, who here formed the tables known by his name. The elevated country in the vicinity of lake Urumea was the seat of the Assassins, finally extirpated by Holaku. M'Kinneir's Persia.

URMUK, a small island in the Red sea, near the coast of Arabia; 3 miles S.S.W. of Loheia.

URMUND, a town of France, in the department of the Lower Meuse; 10 miles N.N.E. of Maestricht.

URN, Urna, a kind of vase, of a roundish form, but biggest in the middle, like the common pitchers; now seldom used, but in the way of ornament over chimney-pieces, in buffets, &c.; or, by way of acroters, at the tops of buildings, funeral monuments, &c.

The great use of urns, among the ancients, was to preserve the ashes of the dead, after they were burnt; for which reason they were called *cineraria*, and *urnæ cinerariæ;* and were placed sometimes under the tomb-stone, upon which the epitaph was cut, and sometimes preserved in vaults in their own houses.

Urns were also used, at their sacrifices, to put liquid things in. They were also of use in the *sortes Prænestinæ*, or casting of lots. At Rome, also, the custom was to absolve or condemn the accused, by the suffrages, or calculi, which the judges cast into the *judicatory* urn.

Virgil represents Minos, the judge of hell, shaking the urn, to decide the lots of mankind.—*Quæsitor Minos urnam movet.*

The urn is still the attribute of rivers, which are painted leaning on urns, representing their sources by the waters flowing from them. We find them represented, in the same manner, on antique medals, and relievos.

These vessels are frequent in many parts of this kingdom, where there have been Roman stations, and are of very various kinds and manner of workmanship.

Dr. Lister, who was very fortunate in his researches into the structure and differences of these remains of antiquity, observed, that in Yorkshire, where there are great numbers found, there were met with three very different kinds, as to their matter and tempers.

1. A blueish-grey sort, which had a great quantity of coarse sand wrought in among the clay. 2. A sort of the same blueish colour, but containing a sand of a much finer kind, and full of mica, and probably made of a clay naturally sandy, or a fine smooth and stiff loam. And, 3. A red sort, made of a fine pure clay, with little or no mixture of sand. These are throughout of a fine red colour like bole, and many of them are elegantly adorned with figures in basso relievo, and usually these have on the bottom, or else on the cover, the name of the workman, which some have mistaken for the name of the person whoses ashes they inclose; but this must be an error, since great numbers of pots and urns are found with the same name. Those are varnished all over, both inside and out, with a varnish of a bright red colour.

The several matters of these urns informed this ingenious inquirer of the place where they were made; which he found to be in the same county on sand-hills, now never used as potteries; but, as he well observes, the difference is very great between the potteries of those days and of ours, since we, who use great quantities of clay, and but little sand, erect these works where there is much clay, and bring the small quantity of sand we use to it; whereas the Romans, on the other hand, who used much sand, and but little clay, naturally established their works where there was plenty of sand, and brought their clay to it.

The Roman urns differ from the earthen-ware made at this time in several particulars. 1. They have no lead-glazing, which seems a modern invention, and is, in many respects, a very bad one. (See Glazing.) 2. They are composed of a far larger quantity of sand than clay. And, 3. They are baked not in an open fire, as our common earthen-ware, but have been inclosed in large earthen vessels, to defend them from the immediate contact of the flames; and hence it is, that the natural colour of the clay they are made of is not altered in them.

The red urns seem to have been the master-piece of the workmen, and to have employed their greatest art; the embossed work upon them is often very beautiful, and their coral-like glazing is more beautiful than any thing of the modern times, and seems to have been done by dipping them all over in some appropriated liquor, and afterwards baking them in the close manner before described. This has certainly been the method they used, since the fragments of these large coffins, or cases, are found near all the Roman potteries. Hooke's Philosophical Collections, p. 87.

The Romans, and most other nations, contented themselves to make their funeral urns of potters' ware, or baked earth; but we find there have been some people who have made them of gold, on particular occasions. In the year 1685, as a peasant of the island of Funen was ploughing a piece of land, which had before lain barren, he turned up no less than six golden sepulchral urns. They were all full of a greyish substance, which some took to be a grey earth; but it was much more probably ashes.

These are all preserved at this time in the museum of the king of Denmark at Copenhagen; the largest of them weighs two ounces and a half, and the others about two ounces and one drachm each. Wormius, and some others, give accounts, that it was an ancient custom among the northern nations to burn their dead, and when they were great persons to collect their ashes, and bury them in golden urns; and the finding of these seems an evident proof of the truth of that account.

These urns were very thin, and each had three rings of gold about their necks, and several circles, one within another, with one common centre carved on the outside round the body of the urn. They held about five ounces of liquids a-piece, or a little more than that; one near six ounces.

Sepulchral urns of crystal were also not uncommon; the same museum has some of these: they are of a conic figure, and have usually a gold wire wound round them. Urns of this kind have been found buried in some parts of Norway.

Urns of another kind were those which they called *lachrymales*, or the *tear-urns:* these were contrived to receive the tears of the friends of the deceased, which were afterwards mingled with the ashes of the burnt corpse. These were made of various materials, and of various shapes and sizes, according to the fancy of particular people. Phil. Trans. N° 285.

URNS, *Vases*, &c. in *Ornamental Gardening*, objects used for the purpose of beauty in some cases of this sort of gardening. It has been observed by Mr. Loudon, in his work on farming and improving country residences, that these are materials which should be introduced with caution; and that none of the others require so much taste and judgment to manage them with propriety as urns, statues, busts, monuments, and inscriptions. The introduction of statues, except among works of the most artificial kind, is seldom or ever, it is said, to be allowed; as when they obtrude themselves among natural beauties, they always disturb the train of ideas that ought to be excited in the mind, and in general destroy the character of the scenery. In the same way, urns, busts, monuments, and other such figures, in flower-gardens, are, it is thought, quite misplaced, as may be felt in many such, by any person capable of attending to his own mind, and who understands the principles of taste. The obvious intention of such appendages is, it is supposed, to recal to mind the virtues, qualities, or actions of those for whom they were erected. Now, it is said, this requires time, seclusion, and undisturbed attention, which must either render all the flowers and other decorations of the ornamental garden of no effect; or, if they have effect, it can only be to interrupt the train of ideas excited by the other. As the garden, and the productions of nature in it, are what are intended to interest the spectator, it is plain, the writer thinks, that the others should not be introduced. This reasoning, while on the one hand it shews the absurdity of such a practice, on the other, it is said, directs that urns, monuments, and such like figures, should only be placed in solitary and unfrequented parts, where the mind is naturally led to contemplate, and where the remembrance of the virtues of great men, or the worth of relations now no more, afford proper subjects of contemplation. But even in places apparently solitary, or secluded, these have been introduced in so affected or improper a manner, as to furnish reason, it is said, for the greatest caution in future.

Though statues may sometimes come in well in sublime productions of architecture, they can seldom raise any sublime emotion, when they become principal in any scenery, as when they are used among trees, flowers, or in shrubberies. If placed among such scenery to be admired as works of art, as fine pieces of sculpture, they will never, it is said, sufficiently interest any but such contracted connoisseurs as would not enjoy the other objects, and would much distract the attention of men of true taste, as is the case with those in many places.

Inscriptions, merely as such, it is said, are in general despicable resources, and only indicate conceit and want of mind. If the inscription be apposite, we are much better pleased to feel or recollect the coincidence on reading, it is said, than to be told it by others; if it be foreign, or far fetched, it argues a gross defect in those who placed it there, and serves to excite ridicule; if it be merely a whim or fancy, as where an urn or seat in a pleasure-ground exhibits in large letters something trifling, it is disgusting.

URN, *Urna*, was also a Roman measure for liquid things; containing about three gallons and a half of English wine measure.

The urn was half the amphora, and four times the congius.

UROCRITERIUM, or UROCRISIA, compounded of ουρον, *urine*, and κριτηριον, *criterion*, *mark*, *sign*, *a casting of water*, or giving judgment on diseases by the sight of water. See URINE.

Hence, also, *uromancy*, *uroscopy*, &c.

UROGALLUS MAJOR, in *Ornithology*. See TETRAO, and also COCK *of the Mountain*, and GROUSE.

UROGALLUS *Minor*. See TETRAO, and also GROUSE.

UROMASTIX, in *Zoology*, a name used by some authors for that sort of lizard called cordylus.

UROPIGIUM, in *Ornithology*, or rump, is that part of birds which is furnished with two glands, secreting a fattish liquor from an orifice in each, and which the birds express with their bills, in order to oil the discomposed parts of their feathers.

UROS, in *Ancient Geography*, a river of Italy, in Liguria, W. of Caristum.

UROSPERMUM, in *Botany*, from ουρα, *a tail*, and σπερμα, *seed*, a name which originated with Scopoli, and is retained by Jussieu for the ARNOPOGON of recent authors; see that genus, described at length, at the end of our article TRAGOPOGON.

UROTAL, in *Mythology*, a name given among the Arabians to Dionysius, or Bacchus, under which appellation they worshipped the sun. See Vossius de Idol. l. 1. c. 8.

UROTCHITSCHE TASCHTI, in *Geography*, a mountain of Russia, on the north coast of the sea of Aral. N. lat. 45° 30′. E. long. 60° 14′.

UROV, a river of Russia, which runs into the Argunia, near Urovka.

UROVKA, a town of Russia, on the Argunia, on the borders of China; 120 miles E. of Stretensk.

VROW-FISH, in *Ichthyology*, the name of a fresh-water fish of the malacostomous, or, as we call it, the leather-mouthed kind, caught in the lakes and rivers of Germany, and esteemed a very delicate fish.

It is something like the English rudd or finscale, but its body is somewhat longer, in proportion to its breadth; its back is brown, and its belly yellow; the belly-fins near the anus are a little reddish, but all the rest are brown; the scales are large and silvery, and the irises of the eyes have each, in their lower part, a blood-coloured spot; the tail is forked; and its usual size is about seven or eight inches, though it is sometimes caught considerably larger. Willughby's Hist. Pisc. p. 253.

URPANUS, in *Ancient Geography*, a considerable river of Pannonia, which discharged itself into the Danube.

URPHA, in *Geography*. See OURFA.

URQUHART, a parish in the shire of Elgin, Scotland, is situated on the coast of the Moray Firth, between the rivers Lossie and Spey, and extends about four miles in length, and three in breadth; but contains no creek or landing place of any kind. The north-west part is flat, and the soil sandy, rising only a few feet above the level of the sea; and probably has been formerly inundated, as there are evident marks of the sea having receded from the coast. The remainder of the parish is more elevated, and of an unequal surface: the air is mild and salubrious; the roads are in excellent repair; and the church is in good condition. The loch of Cotts, which is about a mile in circuit, contains pike only; it is frequented in winter by a great number of swans; and in the spring and autumn by vast flocks of wild fowls.

In the population return of 1811, this parish is stated to contain 229 houses, and 936 inhabitants. Four-fifths of the parish is the property of the earl of Fife, whose plantations cover an extent of 2478 acres, and add greatly to the beauty and ornament of the country. Innes-house, one of the numerous seats of the earl, is a noble mansion: it was formerly the residence of the ancient family of Innes, whose annals are marked with signal calamities. A priory was founded in this parish so early as the year 1125, by king David I.; the scite has been recently converted into an arable field; and the name of Abbey-Well, which the country-people still give to the fountain that supplied the monks with water, is the only memorial now remaining.—Gazetteer of Scotland, 1806. Carlisle's Topographical Dictionary of Scotland, 1813.

URQUHART is also the name of a parish, now united with that of Glen-Moriston, in the shire of Inverness, Scotland. The united parishes occupy an extent of 30 miles in length, and from 8 to 12 miles in breadth. By the return of the year 1811, the population is stated to be 2446; the number of houses 482. The church is situated at Kilmore, in Urquhart: at Meikly, six miles up the country, is a good chapel; and in Glen-Moriston are two respectable meeting-houses, where the duty is performed by a missionary minister. The surface is, in general, mountainous, but comprehends the two valleys of Urquhart and Glen-Moriston, which extend in a westernly direction from loch Ness, nearly parallel to each other, and separated by a ridge of lofty mountains; the highest of which, Mealfuarmhonie, is elevated 3060 feet above the level of the sea. Urquhart is a rich, though not a deep, loam, and uncommonly fruitful; the soil of Glen-Moriston is very inferior, being light and sandy. Three rivers pass through these parishes, the Moriston, Emeric, and Coiltie; they all fall into loch Ness, and in their course form several magnificent cascades. The roads and bridges are in good repair; and at Borlem, a substantial bridge of three arches has been recently built over the Coiltie. On a rocky promontory, on the W. side of loch Ness, are the ruins of Urquhart-castle: the loch washes the east wall, and the other three sides were fortified with a strong rampart, a ditch, and a drawbridge. Within the walls were accommodations for five hundred men. This castle was a royal fort, and was granted by king James IV. in 1509, with the lordship of Urquhart, to sir John Grant, chief of that ancient family, and ancestor to the present earl of Seafield. In the valley opposite to the castle are the remains of a religious house which belonged to the knights templars; and the scite is still called "The Temple." At Corrymony, in Glen-Moriston, are to be seen vestiges of a druidical temple, in which the middle of the circle is occupied by a cairn of loose stones, on the summit of which is one very large stone.—Gazetteer of Scotland, 1806. Beauties of Scotland, vol. v., Inverness-shire, 1808. Carlisle's Topographical Dictionary of Scotland, 1813.

URQUHART is also a parish, now united with that of Logie-Wester, situated partly in the shire of Nairn, and partly in the shire of Ross, Scotland. It extends about nine miles in length, and four in breadth; lying along the eastern side of the Firth of Cromarty, and terminated by the river Conan, which here discharges itself into that arm of the sea. The surface is level, diversified by fertile fields, and sheltered by plantations. A new church has been lately built, on a more eligible situation than the old structure. The population of the united parishes was stated, in the return of the year 1811, to be, for that part in the shire of Nairn, 1510, occupying 369 houses, and for the part in Rossshire, 2664, in 634 houses; making a total of 1003 houses, and 4174 inhabitants. The property of the whole is divided among three heritors, who all possess elegant seats. These are, Findon, the property of sir Roderick Mackenzie, of Scattwell: on this estate is a small market-town, on the high road from Dingwall to Cromarty, where four annual fairs are held: Ferrintosh, belonging to Mr. Forbes of Culloden; this barony long enjoyed the exclusive privilege of distilling whisky without being subject to the excise laws; but in 1786 the right was resumed by government, the superior of the barony being allowed 20,000*l.* as a compensation: and Conan-side, the seat of sir Hector Mackenzie, of Gairloch, on whose estate are plantations of firs and forest-trees, of considerable extent, and in a flourishing condition.—Gazetteer of Scotland, 1806. Carlisle's Topographical Dictionary of Scotland, 1813.

URRIN, a river of the county of Wexford, Ireland, which joins the Slaney, a little south of Enniscorthy.

URRIS HEAD, a cape of the county of Mayo, Ireland, the northern point of the peninsula of the Mullet. N. lat. 54° 17′. W. long. 9° 51′.

URRISBEG, a mountain of Ireland, in the county of Galway, near the sea-coast; 38 miles W. of Galway.

URROLA, a river of Spain, in Guipuscoa, which runs into the sea, between the Orio and the Deva.

URROZ, a town of Spain, in Navarre; 12 miles S.S.E. of Pamplona.

URRY, in *Rural Economy*, a term sometimes applied to a sort of blue or black clay, lying near a vein of coal.

URSA, in *Astronomy, the Bear*, a name common to two constellations of the northern hemisphere, near the pole; distinguished by *Major* and *Minor*.

URSA *Major*, or the *Great Bear*, according to Ptolemy's Catalogue, consists of 35 stars; according to Tycho's, of 56; according to Hevelius's, of 73; but in the Britannic Catalogue, we have 87. See CONSTELLATION.

URSA *Minor*, the *Little Bear*, called also *Charles's Wain*; and, by the Greeks, *Cynosura*; and its neighbourhood to the north pole gives the denomination αρκτος, *bear*, to it. Ptolemy makes it consist of 8 stars; Tycho, of 7; Hevelius, of 12; but Mr. Flamsteed of 24. See CONSTELLATION.

URSA, *Cape*, in *Geography*, a cape of Sicily, on the N. coast. N. lat. 38° 18′. E. long. 13° 11′.

URSAKOWA, a town of Prussia, in the territory of Culm; 15 miles N.E. of Thorn.

URSCHENDOW, a town of Austrian Poland, in Galicia; 28 miles S.W. of Lublin.

URSEL, a town of Germany, in the county of Konigstein; 5 miles E.N.E. of Konigstein.

URSENTANI, in *Ancient Geography*, a people of Italy, in the interior of Lucania. Pliny.

URSEOLA, or URSOLIS, a town of Gallia Narbonnensis, upon the route from Milan to Vienna, in passing by the Cottian Alps. See URSOLI.

URSEREN, in *Geography*, a celebrated valley of Switzerland, into which is an opening by a subterranean passage, through a rock of granite, called "Urner-loch," 9 feet broad, 10 high, and 220 long. In this valley are four villages, *viz.* Urseren, Hopital, Realp, and Zandorf, which form a small republic under the protection of Uri. Its territory is about nine miles in length, and two in breadth, and contains about 1300 inhabitants. The people, in their general assembly, elect their "Talamman," or chief, and also some other magistrates; and there is a permanent council of fifteen members, who assemble in each of the different districts.

tricts. The people enjoy great privileges, but are not absolutely independent; for in civil causes an appeal lies from their courts of justice to Altdorf, and in criminal proceedings, two deputies from the government of Uri are present at the trial, and deliver to the judges of the valley the opinion of the council of Altdorf. This valley, though elevated and cold, affords excellent pasture. Above the village of Urseren is a small plantation of pines, the only wood in the valley, excepting a small quantity of underwood and stubbed willows, that feather the banks of the Reuss. In the adjacent country there are several mines of crystal, a considerable quantity of which is exported. The language of the natives is a kind of provincial German, but almost every person speaks Italian.

The valley of Urseren is surrounded by high mountains, covered with pasture, terminating in barren rocks, in many parts capped with snow. Coxe's Switzerland, vol. i.

URSHULT, a town of Sweden, in the province of Smaland; 22 miles S. of Wexio.

URSIGUNGE, a town of Hindoostan, in Benares; 16 miles W. of Morzapour.

URSINIA, in *Botany*, so named by Gærtner, appears to have been intended as a tribute to the memory of the Rev. John Henry Ursinus, formerly a clergyman at Ratisbon, author of a learned octavo volume, entitled *Arboretum Biblicum*, published at Nuremberg in 1685, after its author's decease, in 1667. Gærtn. v. 2. 462. t. 174. Poiret in Lamarck Dict. v. 8. 256. This is the same genus with Mr. Brown's SPHENOGYNE, (see that article,) under which it ought to have been cited as a synonym. We know not why its earlier name was changed, the labours of Ursinus, though generally compilations, undoubtedly entitling him to such a memorial. There was also a Leonard Ursinus, professor of Botany at Leipsic, who died in 1664, at the age of forty-six, having written upon the Tulip, and on the White Lily, with a double flower; but these treatises were merely academical essays, probably of no great moment. See Dryander's Bibl. Banks. v. 3. 260, and Haller's Bibl. Bot. v. 1. 536, and v. 2. 685.

URSINJAN, in *Geography*, a town of Persia, in the province of Fars, principally distinguished for a strong and narrow defile, bearing the same name. This pass is on the direct road leading from Shirauz to Kerman; 58 miles from the former, and 100 from Robat, the eastern frontier of Fars. It is nearly two miles long, and not exceeding fifty yards in breadth. In some places, the mountains on either side rise perpendicularly to a great height; and, in the opinion of Mr. Pottinger, the place might be defended, with a very small force, against any number of men. The country between this and Robat is tolerably cultivated, and in some places very picturesque.

URSINS, JEAN-JOUVENAL DES, in *Biography*, a prelate and historian of the 15th century, was advanced to several posts, civil and ecclesiastical, and in 1449 became archbishop of Rheims, under which character he consecrated Lewis XI. In consequence of his revision, in concert with other prelates, of the sentence pronounced against the maid of Orleans, it was revoked. His learning and episcopal virtues established a respectable character; and he closed his life at the age of eighty-five, in the year 1473. His "History of the Reign of Charles VI., from 1380 to 1422," is said to be written with correctness and integrity. It was first published by Theodore Godefroi, in 1614, 4to.; and an improved edition by his son appeared in 1653, fol. Moreri. Nouv. Dict. Hist.

URSINUS, FULVIUS. See ORSINI.

URSINUS, ZACHARY, whose family name was BEER, or BEAR, a German Protestant divine, was born at Breslau in 1534, and in the course of seven years' study at Wittenberg, recommended himself by his abilities and diligence to Melancthon, who was then principal of the university. He accompanied his tutor to the conference at Worms in 1557, and having visited Calvin at Geneva, studied Hebrew at Paris under the learned Mercer. In the following year, he accepted an invitation from the magistrates at Breslau to become rector of their public school; but here a complaint was lodged against him by some Lutheran ministers, on account of his explanation of the article on the Lord's Supper, in a book of Melancthon's, which they conceived to be inconsistent with the true principles of Lutheranism. Although he defended himself by a tract on the Lord's Supper and Baptism, the storm continued, so that he applied for a dismission from the magistrates, and returned to Zurich. In 1561, he was invited to Heidelberg, and was made professor in the college of Sapientia. In 1562, he obtained the honour of D.D., and that of the professorship of "Locorum Communium," or of common places; and in this year he drew up the Heidelberg, or Palatine catechism, publishing also, by order of the elector Frederic III. an apology for it, in answer to the remarks of some Lutheran theologians. To the elector, he rendered essential service in forming the plans and statutes of several schools which he founded; and continued at Heidelberg till Frederic's death, in 1577. By his successor, Lewis, who was a strict Lutheran, Ursinus was dismissed; and afterwards settled at Neustadt, as theological professor in a seminary founded by prince Casimir, the son of Frederic. Here he also gave private lectures on logic, and published several works; but intense application hastened his death, which took place in 1583, when he had attained the age of forty-nine years. He was eminently learned, and an excellent teacher: in his disposition modest, but irritable. His various writings were collected after his death, and published in 1611 at Heidelberg, in 3 vols. folio. Bayle. Gen. Biog.

URSINUS, BENJAMIN, originally BEHR, a German mathematician, was born at Sprottaw, in Silesia, in 1587; and resided for a long time as tutor to two young noblemen, along with Kepler, whom he assisted in the construction of the Rudolphine tables, first at Prague, and then at Lintz, in Bohemia. In the latter place, he was teacher of mathematics; and from thence he removed to Frankfort on the Oder, to undertake a similar charge; and here he died in 1633. In 1628, or 1629, he published, at Cologne, his "Cursus Mathematicus," containing Napier's logarithms, and some additional tables of proportional parts; and in 1624, he printed, at the same place, his "Trigonometria," with a table of natural sines and their logarithms, in Napier's form, to every ten seconds in the quadrant, the computation of which was a work of great labour. Haller. Gen. Biog.

URSITZ, ST., or *St. Ursenne*, or *Senderfitz*, in *Geography*, a town of France, in the department of the Upper Rhine; 20 miles S.W. of Bâle. N. lat. 47° 25'. E. long. 7° 6'.

URSKOG, a town of Norway, on the Glanmen; 44 miles N.N.E. of Frederickstadt.

URSNACH, a town of the Helvetian republic, in the canton of Appenzel; 8 miles S.W. of Appenzel.

URSO, (*Ossura* or *Osana*,) in *Ancient Geography*, a town of Hispania, in Bœtica, situated towards the west. It had the title of a republic in an inscription; and its medals, badly

badly executed, had on one side an unknown head, and on the other a sphynx.

URSOLI, a place that occurs in the Itin. of Anton. between Valence and Vienne.

URSPERG, in *Geography*, a princely abbey of Germany; 16 miles W.S.W. of Augsburg.

URSULA, St., a town of the duchy of Stiria; 8 miles W.S.W. of Marburg.

URSULINES, an order of nuns, who observe the rule of St. Augustine; and are chiefly noted for taking on them the education and instruction of young maids.

They take their name from their institutress St. Ursula, and are clothed in white, or black.

This institute was first established in Italy by Angelus de Brescia, in 1537; it was afterwards approved in 1544, by pope Paul III. and united in one nunnery by solemn vows, by Gregory XIII. The Ursulines of France were founded in 1611 by Magdalen Lhuillier, lady of St. Beuve. Their chief house is at Paris, whence they have spread through other parts of the kingdom.

URSUS, Bear, in *Zoology*, a genus of the class of Mammalia and order of Feræ, the characters of which are, that the front teeth are six both above and below, excavated within alternately; the two lateral ones of the lower jaw longer than the rest and lobated, with smaller or secondary teeth at their internal bases; the canine teeth are solitary; the grinders are five or six on each side, the first approximated to the canine teeth; the tongue is smooth; the snout prominent; eyes furnished with a nictitating membrane. Gmelin enumerates eight species, besides several varieties: *viz.*

Arctos. Blackish-brown bear, with abrupt tail. This is the ursus of Gesner, Aldrovandus, Ray, &c. the ours of Buffon, and brown bear of Pennant. The varieties mentioned by Gmelin are the black bear with a smaller black body, the brown bear with a brown and ferruginous body, the white bear with black body and white hairs intermixed, and the variegated bear with a body of various colours. The common bear, with some variations as to size and colour, is a native of almost all the northern parts of Europe and Asia, and is said to be found in some of the Indian islands, as Ceylon, &c.; and the brown bear is also found in some of the northern parts of America, where it destroys cattle; but this is a different species from the American black bear, which is not carnivorous. The common bear inhabits woods and unfrequented places, and feeds chiefly on roots, fruits, and other vegetables, occasionally preying on animals. In the Alpine regions, the bear is brown; in some other parts of Europe, black; and in some parts of Norway of a grey colour, and even perfectly white. The brown, the black, the grey, and the white land bears, are all of the same species: though it is observed, that the brown and the black varieties differ in their mode of life; the black confining itself almost wholly to vegetable food; whereas the brown bear frequently attacks and preys upon other animals, and destroys lambs, kids, and even sometimes cattle, sucking the blood like the cat and weasel tribes. Linnæus adds, that the bear has a mode of blowing up his prey, and of hiding or burying a part of it. Bears are said to be fond of honey, and to climb trees in search of it among the nests of wild bees. They sometimes take up their residence in the hollows of very large trees. They will also catch and devour fish, occasionally frequenting the banks of rivers for that purpose.

The bear passes a considerable part of the winter in a state of repose and abstinence, emerging from his den occasionally at distant intervals, and then concealing himself in his retreat till the approach of the vernal season. The females continue in this state longer than the males, and during this period bring forth their young, which are commonly two in number. The young, though not shapeless animals, as some have erroneously conceived, differ in their aspect from the grown animal, the snout being much sharper, and their colour yellowish; and they are said to be blind for nearly a month.

Americanus. The black bear, with ferruginous cheeks and throat; the black bear of Pennant. This, says Dr. Shaw, is a species distinct from the black bear of Europe, and has a long pointed nose, and narrow forehead; the hair of a glossy black colour, smoother and shorter than that of the European kind, and is generally smaller than the European bear. This animal inhabits all the northern parts of America, and occasionally migrates to the more southerly parts in search of food, which is said to be entirely vegetable; and it is affirmed, that when urged by extreme hunger, they will disregard all animal food whenever they can obtain a supply of roots and grain. They, however, sometimes destroy fish, and particularly herrings, when they come up into the creeks in shoals. They are said to continue in their winter retreats, either in dens beneath the snow under ground, or in the hollows of old trees, for the space of five or six weeks without food. The yellow bear from Carolina is supposed to be a variety of the former: it is rather smaller than the European bears, with a more agreeable countenance, and is perfectly tame and sociable; the colour being of a lively bright orange, inclining to reddish; the hair is thick, long, and silky.

Maritimus. White bear, with elongated neck and head, and abrupt tail: the ursus maritimus albus major arcticus of Martens Spitzbergen, the ours blanc of Buffon, and the Polar bear of Pennant. (See Polar, or *White Bear.*) These bears, when on land, feed on deer and other animals, as hares, birds, &c. and various kinds of berries. They are said to be frequently seen in Greenland in large droves, allured by the scent of the flesh of seals, and will sometimes surround the habitations of the natives, and attempt to break in; and it is added, that the most successful method of repelling them is by the smell of burnt feathers. They grow extremely fat, a hundred pounds of fat having been taken from a single beast. The flesh is coarse, but the skin is valued for coverings of various kinds, and the Greenlanders often wear it for clothing. These skins were formerly offered by the hunters in the arctic regions to the high altars of cathedrals and other churches, for the priest to stand on during the celebration of mass in winter. The split tendons are said to form an excellent thread. Pennant and Shaw. For the method of hunting the bear, see Bear.

Meles. The *Badger* (which see) with unmarked tail, body cinereous or grey above, black below, and a longitudinal black band through the eyes and ears. The common badger is the meles of Gesner, the taxus of Aldrovandus, and the blaireau of Buffon. This animal is an inhabitant of all the temperate parts of Europe and Asia: its form is clumsy, being thick-necked and thick-bodied, with very short legs. It commonly lodges in a hole under-ground, whence it emerges in the night in quest of food, which consists chiefly of roots and fruits, and occasionally of frogs, worms, &c. Its eyes are small, and its ears short and round; and the claws of its fore-feet are very long and straight, which latter circumstance has induced Pennant to rank it under a genus distinct from that of ursus or bear. Some have, without just reason, distinguished between the sow-badger and the dog-badger, the difference being merely sexual. The hair is thick; the teeth, legs, and claws, are very strong; so that it defends itself vigorously when attacked. The young badger may be easily

easily tamed, and it generally prefers raw flesh to every other food in a state of captivity. It is a cleanly animal, and keeps its habitation very neat. The female produces about three or four young. Like the bear, this animal is fond of honey, and will attack hives in order to obtain it. Pennant will not admit the badger to be a carnivorous animal, though Buffon asserts, that it drags young rabbits out of their burrows, and seizes birds, eggs, snakes, and many other animals, for feeding her young. The badger sleeps much, especially in winter, confining himself to his den in a state of semi-torpidity. Ridinger has figured a singular variety of badger, of a white colour, with brown and reddish patches. Gmelin mentions two varieties, one white above and below yellowish; and the other spotted, white with reddish and brown spots. The former is found in New York; the latter is very rarely met with in forests, in the fissures of rocks and stones. For the method of hunting the badger, see HUNTING.

LABRADORIUS. The badger with the tip of the tail villous, and of a brownish-yellow colour; the throat, breast, and abdomen white, and the feet four-toed: it is the pale yellowish-grey badger, with the throat and belly white, and the head striped with black. This is the American badger of Pennant and carcajou of Buffon: and so much resembles the common, that it may be taken for a variety of it. This species is rather scarce in America. It is found in the neighbourhood of Hudson's bay, and in Terra di Labrador, and, according to Pennant, as low as Pennsylvania, where it is called the ground hog. A variety of this occurs in some parts of America, with the under parts slightly tinged with yellow: it is the first variety of common badger mentioned by Gmelin.

LOTOR. The bear with annulated tail, and black transverse band across the eyes. This is the bear with a long tail of the Stockholm acts 1747, the bear with annulated variegated tail of Brisson, the mapach of Fernand and Niereb., the raton of Buffon, the coati of Ray, &c. and the raccoon of Kalm, Pennant, &c. See RACKOON.

LUSCUS. The bear with a long tail, ferruginous body, dusky snout, the forehead and lateral part of the body whitish. This is the quick-hatch or wolverene of Edwards, and the wolverene of Pennant. Dr. Shaw suggests, that it is merely a variety of the next species. It is about twice the size of the common fox, and the description given of it by Edwards is as follows:—All the snout, upper and under jaw, as far as the eyes, is of a black colour; the forehead above becomes gradually of a whitish colour; the eyes are of a dark colour; the throat and lower side of the neck white, the first spotted with black, having some transverse bars of black on the under side of the neck; the ears are small and round, appearing but little longer than the hair that grows on the head; they are covered with short brown hair; the hind part of the head and neck, the whole body both above and beneath, the legs and tail, are all of a brown or chesnut-colour, clouded lighter and darker, viz. the upper side of the neck and beginning of the back is dusky, or very dark brown, which gradually changes to a lighter or more pleasant brown in the middle of the back; this colour again grows by degrees darker, till it becomes almost black in the hind part of the back; the tail towards the tip becomes of a dusky-colour; it hath a broad bar of very light ash-coloured brown passing round the body, beginning at each shoulder, proceeding on the sides backwards, and meeting on the rump, just above the tail, where it is broadest. The fur on the whole body is pretty long, and seems not to lie so flat to the skin as in some animals. All the feet, as far as the heel or first joint, are covered with short black hair, which gradually becomes brown above the knees; the claws are of a light horn-colour; it hath on each foot forwards four toes; the hind feet have five toes each.

GULO. The bear with tail of the same colour, rufous-brown body, and middle of the back black. The gulo of Gesn. and Aldrov., and the glutton of Buffon. It is considerably larger than a badger, but varying in size: the muzzle, as far as beyond the eyes, is blackish-brown, and covered with hard shining hair; over the forehead, down the sides of the head between the eyes and ears, runs a whitish or ash-coloured band or fillet; the top of the head and whole length of the back are black-brown, the colour widening somewhat over the sides as it passes on, and again lessening or contracting towards the tail; or the description might be given in other words, by saying, that the colour of the body is a fine glossy black-brown, with a ferruginous tinge along the sides, so as to form a broad lateral zone; but it is to be observed, that the animal varies considerably in colour; sometimes appearing black, with a subferruginous lateral band; and at other times of a chesnut-colour; the feet are black. Agreeably to its name, it has the character of being very voracious, preying indiscriminately both on fresh food and carrion. One of these animals would eat thirteen pounds of flesh in a day, without being satisfied. It attacks deer, birds, field-mice, &c. and even sometimes the larger cattle; and is said to sit on the branches of trees, and suddenly to spring down on such animals as happen to pass beneath; tearing them, and sucking the blood, till they fall down through faintness, when it begins to devour the spoil. In winter, it seeks out and catches ptarmigans under the snow. What it cannot devour at once it is said to hide under ground, or in the cavity of some tree. It is said to be an animal of uncommon fierceness and strength; and will sometimes dispute the prey both with the wolf and bear. It is also extremely fetid. It breeds once a year, and brings from two to four young at a litter. The fur is much used for muffs, linings, &c. Those skins are said to be preferred which have least of the ferruginous tinge; and for this reason the Siberian variety, which is blacker than the rest, is most esteemed. The glutton is a native of the most northern parts of Europe and Asia, and is found in Sweden, Norway, Lapland, and Siberia, as well as in some of the Alpine regions, and in the forests of Poland and Courland, and in the northern parts of America.

INDICUS. The badger white above and black beneath, first described by Pennant from a specimen brought from India, and in the possession of the late Mr. John Hunter. It had five toes on each foot, with long, straight claws; the head small, the nose pointed, with scarcely any appearance of external ears; the colour of the nose, and face a little beyond the eyes, black; the crown, upper part of the neck, back, and upper part of the tail, white, inclining to greyish; the legs, thighs, breast, belly, sides, and under part of the tail, black. Its food is flesh, and its disposition lively and playful. Dr. Shaw observes, that this animal seems to be nearly allied to the genus viverra; and particularly to the species V. mellivora and V. capensis. See VIVERRA.

URTAMSKOI, in *Geography*, a town of Russia, in the government of Tobolsk, on the Oby; 52 miles W. of Tomsk.

URTICA, in *Botany*, an ancient name, derived from *uro*, to burn, or sting, and alluding to that property, for which the original and familiar species of this genus, our common Nettles, are universally known. For the mode in which this stinging is accomplished, see PUBESCENCE. A great proportion of the species, however, are simply downy, and

and harmless.—Linn. Gen. 486. Schreb. 633. Willd. Sp. Pl. v. 4. 347. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 1014. Prodr. Fl. Græc. Sibth. v. 2. 233. Ait. Hort. Kew. v. 5. 261. Pursh 112. Juss. 403. Tourn. t. 308. Poiret in Lamarck Dict. v. 4. 636. Lamarck Illustr. t. 761. Gærtn. t. 119.—Class and order, *Monoecia Tetrandria*. Nat. Ord. *Scabridæ*, Linn. *Urticæ*, Juss.

Gen. Ch. Male, *Cal.* Perianth of four roundish, concave, obtuse leaves. *Cor.* Petals none. Nectary, the rudiment of a germen, central, small, pitcher-shaped, undivided, tapering at the base. *Stam.* Filaments four, awl-shaped, spreading, the length of the calyx, and opposite to its leaves; anthers of two globular cells.

Female, generally on the same plant, *Cal.* Perianth of two ovate, concave, erect, permanent valves. *Cor.* none. *Pist.* Germen superior, ovate; style none; stigma downy. *Peric.* none, except the closed calyx. *Seed* solitary, ovate, compressed, blunt-edged, polished.

Ess. Ch. Male, Calyx of four leaves. Corolla none. Rudiment of a germen cup-shaped.

Female, Calyx of two leaves. Corolla none. Seed one, superior, polished.

Sect. 1. *Leaves opposite.*

1. U. *pilulifera.* Roman Nettle. Linn. Sp. Pl. 1395. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 148. Mill. Illustr. t. 79. Dodart Mem. t. 38. f. 1. (U. romana; Ger. Em. 706. Fuchs. Hist. 106. Lob. Ic. 522. U. prima; Matth. Valgr. v. 2. 469.)

β. U. balearica; Linn. Sp. Pl. 1395. Willd. n. 2. Ait. n. 2. "Blackwell Herb. t. 321. f. 1."

Leaves opposite, ovate or somewhat heart-shaped, deeply serrated. Heads of fruit globose.—Native of the south of Europe. Abundant amongst stones and rubbish on the coasts of Norfolk and Suffolk, flowering in June and July, and laden with ripening seed through the autumn. *Root* annual. *Herb* branched, bushy, armed in every part with extremely venomous stings, whose wounds are more painful than those of our two common species. The *stem* is bluntly quadrangular, often purplish. *Leaves* stalked, varying much in breadth; sometimes nearly lanceolate; sometimes broadly ovate, or heart-shaped, even from the same seed, or on the same plant, so that *U. balearica*, which has the latter character, is a mere variety: they are always of a dark and lurid green, copiously and very coarsely serrated, rugged, veiny. *Flowers* pale green, on axillary, generally twin, *stalks*, one of which is panicled, bearing numerous distant male blossoms; the other capitate, with only female ones. The *fruit* is a very prickly stinging ball, three quarters of an inch in diameter, composed of numerous tumid *calyces*, each containing a brown *seed*, like flax, but smaller, as Dioscorides well describes it, this plant being, doubtless, his first species of ακαλυφη, or Nettle. Dr. Sibthorp found it very common in Greece and the Archipelago. Linnæus quotes under *U. balearica*, U. pilulifera, foliis cordatis circumserratis; *Hall. Helv.* 27. By way of correction, Willdenow inserts *ed. pr.* or the first edition! But it should be *Hall. Goett.* 27, where this passage may be found, with a reference to Dodonæus, and to Malchant, which should be Marchant, or rather perhaps Dodart. This reference, however, belongs to *U. pilulifera*. Schorigenam; Hort. Mal. v. 2. t. 39, is moreover quoted, though the plant there figured and described is *Tragia involucrata*. Such is too often the history of synonyms! The following species will shew why we judged it necessary to unravel, with much labour, the above citation.

2. U. *Dodartii.* Dodart's Nettle. Linn. Sp. Pl. 1395. Willd. n. 3. Ait. n. 3. (U. altera pilulifera, parietariæ foliis; Dodart Mem., Amsterdam edition, 633. t. 38. f. 2.)—Leaves opposite, ovate, nearly entire. Heads of fruit globose.—The native country of this species is not known, but the plant occurs frequently, as an annual weed, in cultivated ground, in England as well as in France, and is, to use the words of Dodart, more difficult to destroy than to raise. Linnæus justly thought the present a doubtful species, there being no difference between it and the foregoing, except the nearly entire *leaves*, and more slender habit. The late Mr. Davall gathered a wild specimen near Martigny, in Switzerland, of what he took for *U. pilulifera*, but which seems to us *U. Dodartii*, more serrated than usual, though still very unlike the broad coarse pectinated serratures of the *pilulifera* or *balearica*, to which this specimen, nevertheless, betrays an affinity, and confirms the suspicion of Linnæus, of their being all too nearly related. Haller's having none of these species in his work on Swiss plants, made us anxious to determine Mr. Davall's plant, and to clear up the citation above mentioned. *U. Dodartii* ought now perhaps to find a place in the *Flora Helvetica*, though Schleicher has it not in his lists. *U. integrifolia*, Lamarck n. 4, we presume to be a lanceolate-leaved variety of *Dodartii*.

3. U. *pumila.* Dwarf Nettle. Linn. Sp. Pl. 1395. Willd. n. 4. Pursh n. 1.—Leaves opposite, ovate, blunt-pointed, three-ribbed, serrated. Flower-stalks somewhat corymbose, shorter than the footstalks.—In shady woods, among rocks, from Canada to Carolina. Annual, flowering in July. Smooth and shining, very variable in size. *Pursh.* The *stem* in our specimens is simple, about a span high, square, slightly downy, almost naked in the lower part. *Leaves* an inch long, more or less, bluntly serrated, nearly smooth and naked; the lower *footstalks* longest. *Flowers* crowded, as if whorled.

4. U. *longifolia.* Long-leaved Nettle. Willd. n. 5. (U. verbascifolia; Lamarck n. 21.)—Leaves opposite, elliptic-obovate, acute at each end, triple-ribbed, serrated. Corymbs axillary, dense, shorter than the footstalks.—Gathered by Commerson, in the island of Mauritius. According to a note, attached to one of Commerson's specimens, what Lamarck and Willdenow took for a branch, is nearly the whole of the plant, its *stem* being simple, not much above a foot high, angular, clothed with minute close-pressed hairs or bristles, and bearing about four pair of stalked, rarely almost sessile, *leaves*, four or five inches long, and one and a half or two inches broad, roughish on both sides with minute depressed bristles. Their serratures are shallow, most numerous towards the extremity. *Flowers* copious and small. *Seeds* thick-edged. The aspect of this species is like a *Procris* or ELATOSTEMA (see the latter article). Lamarck's name, *verbascifolia*, is changed unwarrantably for the worse, by Willdenow.

5. U. *cuspidata.* Pointed-leaved Nettle. Willd. n. 6. (U. lucens; Lamarck n. 22, without any doubt.)—Leaves opposite, ovate, pointed, serrated, three-ribbed, smooth, and shining. Corymbs axillary, capillary, lax, spreading, nearly as long as the footstalks.—Gathered by Commerson in the Mauritius. The *branches* are round, purplish, very smooth, leafy. *Leaves* two or three inches long, strongly though bluntly serrated; somewhat heart-shaped at the base; their points bluntish and entire. *Footstalks* varying in length from one to two inches. *Corymbs* often in pairs on one common stalk, on some specimens much shorter than the footstalks. *Flowers* very small. *Seeds* minute, brown, scarcely bordered.

6. U. *peduncularis.* Long-stalked Nettle.—Leaves opposite, ovate, pointed, serrated, three-ribbed, smooth. Panicles

Panicles axillary, racemose; their common stalks longer than the footstalks, or even the leaves.—Native of Java. Communicated by Thouin to the younger Linnæus. We cannot find any account of this species, which is very distinct, and among the most handsome and conspicuous. The *leaves* are three inches long, and half as broad; their base not heart-shaped; their points smaller than in the last; their serratures finer and sharper. *Flowers* in large axillary panicles, whose branches are alternate, racemose, and tufted; the *male* ones thrice as large as in the foregoing, and their common stalk stout, longer than the adjoining leaf with its footstalk; the *female* panicle is lower down, rather shorter than the leaf, with much smaller flowers.

7. U. *crassifolia*. Thick-leaved Nettle. Willd. n. 7.—"Leaves opposite, ovate-oblong, acute, three-ribbed, serrated, thickish; reticulated and pale beneath. Corymbs stalked, forked, longer than the leaves. Flowers tufted."—Supposed to be a native of South America. Willdenow saw only an imperfect garden specimen, with the above name. The *stem* is shrubby. *Leaves* stalked, an inch and a half long, veiny, rather fleshy, clothed on both sides with short hairs, which on the under one are so copious, as to give a whitish hue to that surface. *Footstalks* half an inch long. *Corymbs* axillary, on long stalks, reaching beyond the leaves. *Flowers* in roundish heads.

8. U. *grandifolia*. Great-leaved Nettle. Linn. Sp. Pl. 1396. Willd. n. 8. Ait. n. 4. (U. iners racemosa sylvatica, folio nervoso; Sloane Jam. v. 1. 124. t. 83. f. 2.)—Leaves opposite, ovate, pointed, copiously serrated. Stipulas elliptical, entire, glaucous. Corymbs much branched, axillary, longer than the footstalks.—Native of Jamaica, in shady woods. *Stem* from eighteen inches to four feet high. *Leaves* from five inches to a foot or more in length, three-ribbed, stalked; roughish above; smooth and glaucous beneath. *Stipulas* in pairs within the footstalks, permanent, broadly ovate, or somewhat heart-shaped, smooth, glaucous and purplish. *Flowers* brownish, minute, very numerous, tufted.

9. U. *macrophylla*. Doubly-serrated Japan Nettle. Thunb. Jap. 69. Willd. n. 9.—"Leaves opposite, roundish, doubly serrated. Flowers panicled."—Found near Nagasaki, and in Kosido, in Japan, flowering in September and October. The *stem* is square, furrowed, purplish, and like the rest of the plant finely downy. *Leaves* stalked, by no means heart-shaped, three-ribbed, acute, four inches wide, rough with hairs, with deep-cut serratures, which are separately serrated. *Footstalks* shorter than the leaves. *Panicles* axillary. *Thunb.*

10. U. *verticillata*. Whorled Nettle. Vahl Symb. v. 1. 76. Willd. n. 10. (U. iners; Forsk. Ægypt.-Arab. 160.)—"Leaves opposite, ovate, serrated. Flowers axillary, crowded, sessile."—Native of hills in Arabia Felix. Perennial. *Stems* herbaceous, a foot high, branched, square, slender, most hairy upwards. *Leaves* stalked, an inch long, bluntly serrated, somewhat hairy; entire at the base; paler beneath. *Footstalks* slender, hairy, the length of the leaves. *Flowers* somewhat whorled, hairy. *Vahl.*

11. U. *reticulata*. Net-leaved Nettle. Swartz Ind. Occ. 286. Willd. n. 11. Ait. n. 5.—Leaves opposite, elliptic-oblong, acute; serrated towards the point; reticulated beneath. Stipulas ovate, entire. Clusters panicled, about the length of the footstalks.—Native of stony mountainous places, in the interior of Jamaica, according to Dr. Swartz, from whom we have a specimen. The *root* is perennial, with many long tough fibres. This species in many points approaches *U. grandifolia*, n. 8, but the *stem* is more shrubby, and rather taller, though the *leaves* are very much smaller, hardly three inches long, thicker, and reticulated beneath; they are nearly smooth to the touch, though covered with close depressed bristles, especially the upper surface. The *flowers* are very minute, copiously panicled. *Calyx* of the female ones white, with an extremely narrow reddish border. *Swartz.*

12. U. *laxa*. Spreading Nettle. Swartz Ind. Occ. 288. Willd. n. 12.—Leaves opposite, ovate; pointed, serrated. Stem lax. Flowers dioecious; the male in round heads; female in cylindrical clusters.—Native of bushy shady places, on the banks of rivers, in Hispaniola, flowering in the spring. The *stems* are from three to five feet high, smooth, pale, roundish, branched; the branches loosely spreading and zigzag. *Leaves* two or three inches in length, and nearly half as broad, strongly serrated, with three principal ribs, and two small lateral ones, roughish; pale and a little hairy beneath. *Flower-stalks* axillary, slender, longer than the footstalks.

13. U. *diffusa*. Recumbent Nettle. Swartz Ind. Occ. 290. Willd. n. 13.—Leaves opposite, ovate, acute, serrated, hispid. Stipulas revolute. Stem procumbent. Clusters panicled, longer than the leaves.—Native of stony mountains in Jamaica. The *stem* is shrubby at the base, procumbent, sending forth numerous smooth, forked, round *branches*, lying on the ground in every direction, to the extent of two feet, but ascending at their leafy extremities. *Leaves* about an inch long, three-ribbed, shining, clothed with a few scattered harmless bristles. *Footstalks* half as long as the leaves. *Stipulas* intrafoliaceous, small, cloven, reflexed. *Clusters* axillary, opposite, panicled, twice the length of the leaves. *Flowers* monoecious, very minute.

14. U. *betulæfolia*. Birch-leaved Nettle. Swartz Ind. Occ. 291. Willd. n. 14.—Leaves opposite, nearly orbicular, somewhat heart-shaped, serrated. Stipulas oblong. Clusters compound. Stem nearly prostrate, with long runners.—Gathered by Dr. Swartz, in stony shady places, near springs, on the hills of Hispaniola, flowering in May and June. *Root* perennial, creeping, thread-shaped. *Stems* herbaceous, a foot high, lax, scarcely branched, round, leafy, smooth, throwing out very long, slender, brittle runners from the bottom. *Leaves* on long smooth stalks, three-ribbed, veiny, smooth, near an inch broad, deeply serrated; those of the runners nearly sessile. *Stipulas* whitish, undivided, obtuse, erect. *Flowers* extremely minute, whitish, with reddish stalks.

15. U. *rufa*. Rusty Nettle. Swartz Ind. Occ. 292. Willd. n. 15. Ait. n. 6.—Leaves opposite, elliptical, acute, serrated, triple-ribbed; their veins hairy. Stipulas roundish, permanent. Clusters slightly branched. Stem shrubby, shaggy with rusty hairs.—Native of stony mountainous places, in the south part of Jamaica, flowering in spring. The *stem* is a foot high; woody, simple, naked and smooth in the lower part; bushy above, leafy, and clothed with long, dense, rusty down. *Leaves* three quarters of an inch long, neatly serrated; their stalks half as long. *Stipulas* whitish, clasping the stem above the footstalks. *Clusters* on long, hairy, axillary stalks. *Flowers* minute; the male ones largest, intermixed with the female. These last five West Indian species are all destitute of stings, as well as *grandifolia*, n. 8, to which they are more or less akin, though far inferior in size.

16. U. *urens*. Small Stinging Nettle. Linn. Sp. Pl. 1396. Willd. n. 16. Fl. Brit. n. 2. Engl. Bot. t. 1236. Pursh n. 2. Curt. Lond. fasc. 6. t. 70. Fl. Dan. t. 739. Bulliard t. 230. (U. minor; Ger. Em. 707. Fuchs. Hist. 108. Brunf. Herb. v. 1. 154. U. tertia; Matth. Valgr. v. 2. 471.)—Leaves opposite, elliptical, strongly serrated,

serrated, about five-ribbed. Stipulas lanceolate, reflexed. Clusters oblong, nearly simple.—Common throughout Europe, in cultivated ground, where it proves a most troublesome annual weed, of quick growth, and very prolific, often producing two crops in a year. In America it is more rare. The *herb* is rather bushy, bright green, armed all over with venomous stings. *Leaves* an inch or more in length, coarsely and deeply serrated, full twice as long as their *footstalks*. *Stipulas* small, narrow, reflexed. *Clusters* stalked, drooping, hardly equal, in general, to the footstalks, composed of male and female *flowers* intermixed. *Seeds* bordered.

17. U. *spatulata*. Spatulate Stinging Nettle. (U. minor urentissima; Commers. MSS.)—Leaves opposite, orbicular-heartshaped, deeply serrated, shorter than their footstalks, mostly three-ribbed. Clusters capitate, very short. —Gathered by Commerson at Monte Video. The *stem* is more elongated, and less branched, than in the foregoing, very densely leafy. Whole *herb* plentifully armed with long venomous stings. *Footstalks* near an inch long. *Leaves* about half that length, with deep-cut, acute, radiating serratures. The *stipulas* we have not seen. *Flowers* much like *U. urens*, but in shorter tufts, and the seeds appear to be less conspicuously bordered. We suspect this to be a perennial species.

18. U. *dioica*. Great Stinging Nettle. Linn. Sp. Pl. 1396. Willd. n. 17. Fl. Brit. n. 3. Engl. Bot. t. 1750. Pursh n. 3. Curt. Lond. fasc. 6. t. 69. Fl. Dan. t. 746. (U. urens; Ger. Em. 706. U. major; Fuchs. Hist. 107. Bruns. Herb. v. 1. 151. U. secunda; Matth. Valgr. v. 2. 470.)—Leaves opposite, heart-shaped, sharply serrated. Stipulas ovate, distinct, spreading. Clusters much branched, in pairs, longer than the footstalks, mostly dioecious.—Common in waste ground, throughout Europe, as well as in North America and Asia, flowering in the middle of summer. The perennial creeping *root*, larger size and duller green of the whole plant, and the large branching *flower-stalks*, render this very obviously distinct from n. 16. The *stems* are three feet, or more, in height. Every part is armed with stings. *Flowers* chiefly male on one plant, female on another. *Calyx* of the latter often furnished with a pair of *bracteas* at its base. The fibres of the *stem* may be manufactured into thread, but are inferior to hemp. The young leaves, boiled in spring, are not a bad substitute for spinach, to which herb the Nettle is allied, as well as to the hemp, in botanical affinity. Leers remarks the two additional leaves, or *bracteas*, to the female *calyx*, in *U. urens*, as well as in the present species.

19. U. *gracilis*. Slender-stalked Nettle. Ait. ed. 1. v. 3. 341. ed. 2. n. 12. Willd. n. 29. (U. procera; Willd. n. 18. Pursh n. 4.)—Leaves opposite, ovato-lanceolate, serrated; heart-shaped at the base. Stem and footstalks hispid. Flowers dioecious. Clusters in pairs, somewhat branched, about as long as the footstalks.—Native of Hudson's Bay, from whence it was brought to Kew, in 1782. *Aiton*. Found by the sides of waters, in rocky situations, from Canada to Pennsylvania, flowering in July and August. Perennial. The specimen of *U. gracilis*, in the herbarium of A. B. Lambert, esq., agrees in every respect with *procera*. *Pursh*. This being the case, we retain, of course, the original name. We have seen no specimen of either plant. *U. procera* is described by Willdenow as very nearly related to the common *dioica*, so as to be possibly no more than a variety; but differing in its less heart-shaped *leaves*, whose serratures are smaller. The *footstalks* are fringed with bristles towards the base of each leaf, where the *dioica* is downy only. The *spikes*, or *clusters*, moreover, are less compound, sometimes shorter than the footstalks, not longer.

20. U. *morifolia*. Mulberry-leaved Nettle.—Leaves opposite, heart-shaped, broadly and bluntly serrated. Stipulas ovate, combined, reflexed. Clusters in pairs, cylindrical, unbranched, drooping.—Sent by Mutis from Mexico. Linnæus considered it as *U. dioica*, from which, when examined, it manifestly differs in the above characters, and, even at first sight, in the broad blunt serratures of the nearly naked, though rough, *leaves*, whose surface is even, not wrinkled, except when very young. The *clusters* are slender, and in our specimen entirely female. *Seed* nearly orbicular, crowned with a short *style*.

21. U. *chamædryoides*. Germander Nettle. Pursh n. 5. —"Leaves opposite, almost sessile, ovate, serrated; bristly beneath. Tufts of flowers axillary, sessile, nearly globose, reflexed. Stem armed with stings."—On the islands of Georgia, St. Simon's, &c. *Mr. Lyon*. Annual, flowering in May. The *leaves* are small. *Stings* white, very conspicuous. *Pursh*.

22. U. *membranacea*. Wing-stalked Nettle. Poiret in Lamarck n. 9. Willd. n. 19. Desfont. Atlant. v. 2. 340. (U. caudata; Vahl. Symb. v. 2. 96. U. dioica β; Linn. Sp. Pl. 1396.)—Leaves opposite, broadly ovate, somewhat heart-shaped, coarsely serrated. Flowers monoecious; the male in twin, upright, unbranched, stalked spikes, with a winged receptacle; female in nearly sessile spikes, shorter than the footstalks.—Native of the south of Europe, the north of Africa, and the isle of Bourbon, in which last place our specimen was gathered by Commerson. The *root* is perennial. *Herb* stinging, resembling *U. dioica*, but paler, more delicate, of a brighter green; the *leaves* also are broader, rounder, less sharply serrated, on longer stalks. The *stipulas* are almost perfectly combined, spreading. The upright, stalked, unbranched, linear *male spikes*, with their membranous-winged *receptacle*, form the most remarkable character of the present species. They grow in pairs, from the bosoms of the upper *leaves*, which they greatly exceed in length. The *female spikes*, situated lower down, are much shorter, and less conspicuous. Their *calyx* is downy.

23. U. *ferox*. Armed Nettle. Forst. Prodr. 66. Willd. n. 20.—Leaves opposite, hastate-heartshaped, coarsely toothed, fringed with bristles; downy beneath. Stipulas heart-shaped. Clusters panicled, in pairs, longer than the footstalks.—Gathered by Forster, in New Zeeland. A shrub, whose *branches* and *footstalks* are clothed with hoary down. The midrib of each *leaf* is beset, on the upper side, with rigid bristles; the under side is downy. The habit of the plant resembles *U. dioica*. *Willdenow*.

24. U. *ficifolia*. Fig-leaved Nettle. Lamarck n. 10. Willd. n. 21.—Leaves opposite, heart-shaped, somewhat hastate, acutely five-lobed, crenate; downy beneath. Panicles cymose, divaricated.—Gathered by Commerson, in the isle of Bourbon. This appears to be a tree, with thick, rather fleshy, *branches*, leafy at their extremities. The *leaves* grow on longish *footstalks*, and are three inches long, nearly as much in breadth, very irregularly five or seven-lobed, with taper points; their upper surface almost smooth; under clothed with white silky pubescence. The same tree sometimes bears deeply three-lobed, as deeply pinnatifid, *leaves*. *Flowers* very numerous, small, whitish, in large, compound, spreading *panicles*, somewhat like the cymes of Elder, but not so large.

25. U. *cannabina*. Hemp-leaved Nettle. Linn. Sp. Pl. 1396. Willd. n. 22. Ait. n. 9. (U. foliis profundè laciniatis, semine lini; Amman. Ruth. 173. t. 25.)—Leaves opposite, in three deep pinnatifid segments. Clusters cylindrical,

lindrical, in pairs, erect.—Native of Siberia, especially beyond lake Baikal. Miller appears to have had it at Chelsea, in 1749. A hardy perennial, five or six feet high, flowering from July to September, well compared, in its foliage, to Hemp. The *leaves* are of a deep rich green, rough with very minute points, and a few marginal bristles, on the upper side; smooth at the back. *Footstalks* half the length of the leaves, armed, like the *stem*, with scattered, large, and powerful stings. *Clusters* thick, an inch and a half or two inches long, being about half the length of the leaves with their footstalks. *Flowers* and *seeds* very large in proportion to most of the foregoing. *Calyx* beset with stings.

26. U. *virgata*. Wand-like Nettle. Forst. Prodr. 66. Willd. n. 23.—"Leaves opposite, ovate, serrated, three-ribbed. Spikes axillary, solitary, interrupted."—Native of the Society Isles. *Forster*.

27. U. *rugosa*. Rugged-leaved Nettle. Swartz Ind. Occ. 293. Willd. n. 24.—Leaves opposite, elliptical, serrated, three-ribbed, rugged. Clusters short, dense, terminal. Stem simple, erect.—Native of moist stony places, about the banks of rivers, in Hispaniola, flowering in spring. *Root* annual. *Stem* a foot high, round, downy. *Leaves* crossing each other in pairs, stalked, from one to two inches long, finely and regularly serrated, rough but not stinging, somewhat plaited at the margin; hairy beneath. *Stipulas* large, ovate. *Flowers* dioecious, very minute and crowded, in tufts shorter than the stipulas.

28. U. *repens*. Creeping-stalked Nettle. Swartz Ind. Occ. 294. Act. Holm. for 1787. t. 1. f. 1. Willd. n. 25.—Leaves opposite, roundish-ovate, obtuse, bluntly serrated, three-ribbed; entire at the base. Clusters capitate, axillary, stalked. Stem simple, creeping.—Found on the sandy banks of rivers in Hispaniola, flowering in the spring. The *root* is annual and fibrous. *Stem* a span long, creeping close to the ground by means of radicles from each joint. *Leaves* hardly an inch long at the utmost, slightly hairy, not stinging. *Footstalks* hairy, shorter than the leaves. *Flowers* monoecious, in little oblong *clusters*, on capillary, opposite stalks; much shorter than the leaves.

29. U. *stolonifera*. Trailing Nettle. Swartz Ind. Occ. 296. Willd. n. 26.—Leaves opposite, elliptic-oblong, slightly serrated. Stem ascending, with radical runners. Panicles terminal, solitary, dioecious, on slender stalks.—Found on the rocky banks of rivers, among mosses, in the interior part of Hispaniola. *Root* perennial. *Stem* none, or very short; in Dr. Swartz's specimens two or three inches long, simple, most leafy at the top, sending out trailing shoots from the base, clothed with very small *leaves*. The *leaves* of the main stem are about an inch long, rough to the touch, and rather downy, but not stinging; the *footstalks* about the same length. *Stipulas* oblong, entire, membranous, accompanying all the leaves. *Flower-stalks* from the middle of the crowded terminal (not radical) leaves, which they exceed in length. *Flowers* green, small; the male in a roundish dense tuft; female in an oblong, lax, compound panicle; on distinct plants.

30. U. *nudicaulis*. Naked-stalked Nettle. Swartz Ind. Occ. 311. Willd. n. 27. Ait. n. 11.—Leaves chiefly terminal, opposite, elliptic-lanceolate, pointed, three-ribbed, entire, nearly smooth. Stem angular; leafless below. Clusters lateral, dioecious.—Native of lime-stone rocks, in the interior of Jamaica. *Root* fibrous. *Stem* one or two feet high, nearly erect, scarcely branched, jointed, angular, and striated, contracted at the joints; its light-green colour, and smooth surface, in some degree resembling the stems of several species of *Epidendrum*, or their allies. *Leaves* chiefly about the top of the plant, on short stalks, generally smooth and naked, one and a half or two inches long, very minutely dotted, destitute of *stipulas*. The uppermost *clusters* are axillary, the rest at the joints of the stem, opposite, small. *Flowers* minute, white, crowded, very rarely monoecious. Dr. Swartz mentions a variety, with narrower, somewhat hispid, *leaves*; longer, more diffuse, *clusters*; and a less naked *stem*.

31. U. *lanceolata*. Lanceolate-leaved Nettle. Lamarck n. 15. Willd. n. 28.—Leaves opposite, linear-lanceolate, three-ribbed, entire, nearly sessile. Clusters capitate, axillary, solitary.—Native of Hispaniola. *J. Martin*. Poiret says this species is remarkable, and very distinct, on account of its narrow, linear-lanceolate, nearly sessile, *leaves*. The *stems* are weak, herbaceous, naked, almost cylindrical, jointed. *Leaves* about an inch long, and two or three lines broad, somewhat wavy at the edges; paler beneath. By the description, there seems some reason to doubt whether this be distinct from the last, but we have seen no specimens of it. On the other hand, *nudicaulis* is in the list of species unknown to M. Pourret.

32. U. *corymbosa*. Corymbose Entire-leaved Nettle. Lamarck n. 17. Ait. n. 30.—Leaves opposite, ovate, pointed, entire; unequal at the base. Corymbs axillary, on elongated stalks.—Native of Guadeloupe. *Badier*. *Stems* very rough, with glandular points. *Leaves* about five inches long, and three broad, one side shorter than the other at the base; their surface rough to the touch. *Footstalks* very long, but shorter than the leaves. *Corymbs* each on a long, simple, axillary common stalk, probably like our *peduncularis*, n. 6.

33. U. *Parietaria*. Pellitory-leaved Nettle. Linn. Sp. Pl. 1397. Willd. n. 31. Ait. n. 13. Swartz Obs. 357. (Parietaria foliis ex adverso nascentibus, urticæ racemiferæ flore; Sloane Jam. v. 1. 144. t. 93. f. 1.)—Leaves opposite, ovato-lanceolate, entire. Stem much branched. Flowers dioecious.—Native of lofty mountains in the West Indies, flowering throughout the year. *Stem* from two to eight feet high, erect; somewhat shrubby in the lower part; much branched and herbaceous above, red, quadrangular, striated; the ultimate branches slender, wavy, leafy, and smooth. *Leaves* stalked, an inch or inch and a half long, pointed, three-ribbed, veiny, fringed, very slightly, if at all, unequal in the two halves: on the small flowering branches one of two opposite leaves is but a third the size of the other. *Footstalks* long, red, spreading. *Clusters* stalked, axillary, terminal, or opposite to some of the leaves; their stalks slender, coloured, erect, smooth, quadrangular, longer than the footstalks. *Flowers* very small. *Seed* minute, black, shining. Such is Sloane's and Swartz's plant, of which we are obliged to the latter for specimens. It is wanting in the Linnæan herbarium.

34. U. *ciliaris*. Fringed Three-furrowed Nettle. Linn. Sp. Pl. 1396. Willd. n. 32. (Parietaria racemosa, foliis ad oras villosis; Plum. Ic. 111. t. 120. f. 2.)—Leaves opposite, ovate, entire, strongly three-ribbed, fringed. Clusters divaricated, corymbose, much branched.—Native of the West Indies, but rare. A specimen was given by sir Joseph Banks to the younger Linnæus. The *branches* are very smooth, reddish, obtusely quadrangular. *Leaves* stalked, from one to two inches long, pointed, smooth, except some scattered and marginal white hairs; the three ribs remarkably prominent beneath, and furrowed above. *Clusters* axillary, opposite, stalked, level-topped, widely spreading, half the length of the leaves. The fringe of the latter is far less evident in our specimen, than in Plumier's figure, and yet we have no doubt of its identity.

35. U.

35. U. *hederacea.* Ivy-leaved Nettle. Lamarck n. 29.—"Leaves oppoſite, roundiſh-ovate, crenate; abrupt at the baſe. Cluſters ſhort, on long ſtalks."—Native of Guadeloupe. *Richard.* A ſmall ſpecies, with fibrous *roots*, and weak *ſtems*, two or three inches high, clothed with fine ſhort hoary hairs. *Leaves* ſtalked, ſmall, with large notches, like thoſe of Ivy in miniature, with a few ſcattered hairs, eſpecially on their ribs and footſtalks. *Flowers* in little denſe tufts, on axillary ſtalks twice the length of the leaves. *Poiret.*

36. U. *rhombea.* Rhomb-leaved Nettle. Linn. Suppl. 417. Willd. n. 33.—Leaves oppoſite, rhomboid, entire, three-ribbed, flat, about the length of their footſtalks, which are longer than the cymoſe axillary panicles.—Sent by Mutis from Mexico. The *ſtem* is herbaceous, about a foot high, much branched, ſmooth, leafy. *Leaves* from half an inch to an inch, or rather more, in length, and above half as much acroſs their middle, obtuſely pointed at each end, ſmooth and even on both ſides, without ſtings. *Stipulas* ſhort, membranous, abrupt. *Flower-ſtalks* axillary, ſolitary or in pairs, ſcarcely ever ſo long as the footſtalks. *Bracteas* lanceolate, membranous, at each of their ſubdiviſions. *Flowers* crowded into little heads, ſmall, monoecious. *Seeds* elliptical, beaked. The whole plant reſembles a *Parietaria.*

37. U. *ciliata.* Speedwell-leaved Nettle. Swartz Ind. Occ. 298. Willd. n. 34.—Leaves oppoſite, elliptical, three-ribbed, crenate, fringed, acute at each end; entire at the baſe. Stem divaricated. Flowers aggregate, on axillary ſtalks, about the length of the footſtalks.—Found in rocky woods, in the interior of Jamaica. The *ſtem* is herbaceous, dividing from the baſe into ſeveral ſmooth, ſpreading, aſcending branches, about ſix inches high. *Leaves* an inch long, not unlike *Veronica officinalis* in general aſpect, but ſhorter, on longiſh ſtalks, crenate rather than ſerrated, minutely downy, not ſtinging. *Stipulas* minute, accompanied by tufts of hairs. *Flowers* moſt aſſuredly axillary, not terminal, forming a kind of umbels, in which the male ones ſeem to occupy the upper part. This ſpecies is, as Dr. Swartz obſerves, totally different from the Linnæan *U. ciliaris*, but we would beg leave to remark that their names are too much alike.

38. U. *radicans.* Paraſitical Nettle. Swartz Ind. Occ. 299. Willd. n. 35.—Leaves oppoſite, ovate, crenate, ſhining; ſlightly wedge-ſhaped at the baſe. Flowers axillary, nearly ſeſſile. Stem and branches trailing, with downy radicles.—Native of umbrageous foreſts, in the interior of the northern part of Jamaica, where it trails over the trunks of trees, even to their very ſummits, thriving plentifully under their ſhade, as well as on the rotten trunks of fallen trees in the ſame ſituations; but it rarely bloſſoms. The ſpreading *ſtems* are ſometimes attached throughout their whole length, by ſhaggy or downy radicles; they are brittle, ſubdivided, with many oppoſite leafy branches. *Leaves* ſtalked, horizontal, obtuſe, half or three-quarters of an inch long; their upper ſurface covered with minute depreſſed briſtles, though not harſh to the touch, nor ſtinging. *Stipulas* ſcarcely diſcernible. *Flowers* minute, green, the male and female ones in the ſame axillary tuft.

39. U. *pendula.* Pendulous Nettle. Willd. n. 36. (U. rupipendia; Lamarck n. 18. "U. umbellata; Bory de St. Vincent Voy. v. 3. 173.")—Leaves ovate, bluntly ſerrated, generally four in a whorl, on unequal footſtalks. Cluſters axillary and terminal, on long ſolitary ſtalks, ſomewhat corymboſe.—Native of the iſles of Mauritius and Bourbon, hanging from the rocks in an elegant manner. The *root* is fibrous, apparently perennial. *Stems* from eight to twelve inches long, covered with minute depreſſed briſtles, and dividing at the extremity into many ſpreading, oppoſite, leafy branches. *Leaves* hardly an inch long, broadly ovate, ſomewhat triple-ribbed, and marked with many tranſverſe veins; their under ſide ſmooth, brown or purpliſh; upper bright green, covered with very minute depreſſed briſtles, as in the laſt, which do not interfere with their ſmoothneſs to the touch. Some of the *footſtalks* are as long as the correſponding leaf; others in the ſame whorl but half that length. *Flower-ſtalks* longer than the longeſt footſtalks, ſlender, ſmooth, ſolitary, forked at the upper part, bearing ſeveral little round tufts of *flowers*, which in our ſpecimen are all female, and in ſeed; nor do we find any traces or remains of male ones. M. Poiret in Lamarck deſcribes the upper ſide of the *leaves* ſmooth, the under ſlightly downy; yet we cannot doubt his plant being the ſame as ours. He ſpeaks of a variety with narrower, more lanceolate and pointed, *leaves*, which has not fallen in our way.

40. U. *faſciculata.* Tufted Nettle. Poiret in Lamarck n. 19.—"Leaves oppoſite, ovate, toothed, on long ſtalks. Flowers tufted at the diviſions of the panicle."—Native of Carolina. M. Poiret ſays this is very diſtinct from the preceding. The *leaves*, like every other part, are ſmooth, much larger than the laſt, acute, generally remarkable for the great length of the ſmooth ſlender *footſtalks*. *Cluſters* many-flowered, very denſe, crowded, aggregate and axillary, hardly longer than the footſtalks.—We have ſeen no ſpecimen anſwering to this deſcription, nor is the preſent ſpecies adopted by Willdenow or Purſh; at leaſt not by the above name.

41. U. *ſeſſilifolia.* Seſſile-leaved Whorled Nettle. Poiret in Lamarck n. 30. Willd. n. 37.—Leaves nearly ſeſſile, lanceolate, ſharply ſerrated, three or four in a whorl.—Gathered by Commerſon in the iſle of Mauritius. The *ſtems* are rather woody, with ſtraight leafy branches. *Leaves* moſtly four in each whorl, their teeth, or ſerratures, pointed; both ſurfaces covered with ſhort, white, not very evident, hairs, ſuch as are found alſo on the ſtem; the upper ſide is of a fine green; the under a little reddiſh. The *flowers* have not been obſerved, ſo that the genus is preſumed from the habit only.

42. U. *nummularifolia.* Moneywort-leaved Nettle. Swartz Ind. Occ. 301. Act. Holm. for 1787. t. 1. f. 2. Willd. n. 38. (Nummularia ſaxatilis minima repens, floribus albis, foliis crenatis villoſis; Sloane Jam. v. 1. 208. t. 131. f. 4.) —Leaves oppoſite, orbicular, crenate, hairy. Cluſters denſe, terminal, monoecious. Stems thread-ſhaped, ſimple, creeping.—Native of fiſſures of rocks, among the mountainous woods of Jamaica. A pretty little creeping ſpecies, downy, or minutely hairy, all over. The *leaves* are about half an inch in diameter, obtuſe, bright green, crenate like thoſe of a *Chryſoſplenium*; paler beneath. *Stipulas* membranous, whitiſh, obtuſe. *Cluſters* from the boſoms of the uppermoſt leaves, each of ſeveral male and female *flowers*; the former largeſt, on longer ſtalks; the latter very minute. *Seeds* nearly orbicular, brown, tumid.

43. U. *depreſſa.* Depreſſed Nettle. Swartz Ind. Occ. 303. Willd. n. 39.—Leaves oppoſite, roundiſh, crenate, ſmooth. Cluſters denſe, terminal, dioecious. Stem creeping, ſubdivided.—Native of ſhady graſſy borders of fields, in the interior of Jamaica. Perennial. *Stem* three or four inches long, ſucculent, preſſed cloſe to the earth, and fixed by many ſmall radicles. The ſhort *branches* form a kind of turf with the adjoining plants. *Leaves* ſmall, ribbed, rather ſucculent, of a browniſh green. *Stipulas* ovate, ſmall and white. *Flowers* dioecious, about three to five, in little terminal ſeſſile cluſters; the female ones extremely minute.

Seeds roundiſh, black. Differs from the laſt in its ſmoothneſs, darker colour, dioecious *flowers*, and more numerous, entangled, depreſſed, copiouſly branched, *ſtems*.

44. U. *herniarifolia*. Rupture-wort Nettle. Willd. n. 40. (U. herniarioides; Swartz Ind. Occ. 309. Act. Holm. for 1787. t. 2. f. 1.)—Leaves oppoſite, roundiſh, entire; tapering at the baſe: the terminal ones four in a whorl. Flowers terminal, ſtalked, monoecious. Stem thread-ſhaped, diffuſe.—Found on large ſtones, in the rivers and rivulets of Hiſpaniola. A very ſmall, ſlender, ſmooth, trailing, annual herb, three or four inches long at moſt, not much branched. *Leaves* ſtalked, ſomewhat ſpatulate, bluntiſh, ſcarcely two lines in diameter; their upper ſurface covered with depreſſed briſtles, as if ſtitched, but not rough to the touch. *Flowers* exceſſively ſmall, in little terminal monoecious tufts. *Seed* brown.

45. U. *microphylla*. Small-leaved Nettle. Swartz Ind. Occ. 305. Willd. n. 41. Ait. n. 14. (Parietaria microphylla; Linn. Sp. Pl. 1492. Am. Acad. v. 5. 412. Herniaria lucida aquatica; Sloane Jam. v. 1. 145. t. 93. f. 2.)—Leaves oppoſite or cluſtered, ovate, acute, ſucculent, nearly entire. Flowers ſcattered, dioecious. Stems aſcending, branched in the upper part.—Very common throughout the Weſt Indies, in waſte or watery places, or on old walls, &c. flowering throughout the year. The *roots* are perennial, long and capillary. *Herb* much ſtouter and more erect than the preceding, about four inches high, with innumerable minute *leaves*, reſembling that ſpecies, but more ovate and acute, as well as occaſionally notched; their upper ſide in like manner clothed with cloſe briſtles. *Flowers* axillary, ſtalked; the male largeſt, reddiſh; the female on a ſeparate plant, with ſhorter ſtalks, crowded, very minute. *Seed* roundiſh, poliſhed.

46. U. *trianthemoides*. Purſlane-leaved Nettle. Swartz Ind. Occ. 307. Willd. n. 42.—Leaves oppoſite, obovate, obtuſe, entire; one much ſmaller than the other. Flowers monoecious. Stem erect, branched.—Native of ſhady rocky places, near rivers, in Hiſpaniola. Perennial. *Stem* herbaceous, a foot high, jointed, branched from the baſe, ſucculent and ſmooth; ultimate branches alternate, ſpreading, leafy. *Leaves* ſtalked, of a ſhining green, ſmooth to the touch, but ſtriated, as it were, with ſmall, inſeparable, flattened briſtles, on the upper ſide; the under being dotted, and only partially hairy. The largeſt *leaf* of each pair is not an inch long; the ſmaller ſcarcely one-fifth that ſize. *Stipulas* none. *Flowers* numerous, in axillary or lateral tufts, at each joint of the branches. The female *calyx* is ſaid to conſiſt of three valves.

47. U. *ſerrulata*. Blunt-notched Nettle. Swartz Ind. Occ. 313. Willd. n. 43.—Leaves oppoſite, lanceolate, abruptly ſerrated, nearly ſeſſile; tapering at the baſe. Heads of flowers axillary, ſtalked. Stem ſhrubby, quadrangular.—Native of limeſtone rocks, in the interior of Jamaica, flowering in the vernal months. A little, ſhrubby, buſhy plant, about a foot high, with ſcattered, ſquare, roughiſh, but not hairy, leafy branches. *Leaves* about an inch long, dark green, minutely briſtly, or ſtitched, as it were, on the upper ſide, like ſeveral of the foregoing; paler beneath; tapering at the baſe into ſhort *footſtalks*; furniſhed in their upper part with blunt, ſomewhat glandular, ſerratures. *Flowers* monoecious, their *ſtalks* red, ſhorter than the leaves; the male ones with a red *calyx*.

48. U. *lucida*. Shining Cut-leaved Nettle. Swartz Ind. Occ. 315. Willd. n. 44.—Leaves oppoſite, pinnatifid, ſhining, clothed on both ſides with depreſſed briſtles. Heads of flowers on axillary ſtalks, longer than the leaves. Stem ſhrubby, angular.—Found in rocky, or waſte places, among the cooler mountains of Jamaica, flowering in ſpring. A very pretty little ſhrub, the height of the laſt, with brown quadrangular *branches*. The bright-green ſhining *leaves*, ſcarcely half an inch long, reſemble thoſe of an Oak, or rather of *Myrica quercifolia*, in miniature, their lobes and ſinuſes being rounded in a ſimilar manner. Their flattened briſtles are large in proportion. *Flower-ſtalks* ſimple, capillary, each bearing a very ſmall head, in which the male and female *flowers* are intermixed.

49. U. *trilobata*. Three-lobed Glaucous Nettle. Poiret in Lamarck n. 14. Willd. n. 45.—Leaves oblong, obtuſe, undivided or three-lobed, ſtalked, three or four in a whorl, hoary with cloſe-preſſed briſtles. Stem round, with quadrangular branches.—Gathered in the iſland of Mauritius by Commerſon, one of whoſe ſpecimens is before us. This, like what M. Poiret examined, is deſtitute of fructification, but the habit, and eſpecially the remarkable depreſſed briſtles of the *leaves*, ſo copious as to render the plant glaucous or hoary, ſcarcely allow of a doubt as to the genus. The *ſtem* is ſomewhat ſhrubby, buſhy, of taller ſtature than the two laſt; round, glaucous, and leafleſs below; furniſhed at the upper part with elongated, ſquare, leafy, oppoſite or ternate, branches. *Leaves* on longiſh ſtalks, ſpreading, of a greyiſh-green, ſmooth to the touch, linear-oblong, rounded at each end, ſcarcely an inch in length; ſome of them quite undivided and entire; but the greater part are furniſhed at each ſide, about the middle, with a ſmall, ſpreading, obtuſe lobe. A few of the lower *leaves* are oppoſite only.

50. U. *cuneifolia*. Smooth Wedge-leaved Nettle. Swartz Ind. Occ. 319. Willd. n. 46.—Leaves oppoſite, obovate-wedgeſhaped, very ſmooth, toothed at the end; one much ſmaller than the other. Cluſters terminal, on capillary ſtalks. Stem ſhrubby, round.—Native of maſſy lime-ſtone rocks, among the mountains of Jamaica. *Root* creeping. *Stem* from three inches to a foot in height, erect, branched, ſtriated, ſmooth. *Leaves* almoſt ribleſs, on very ſhort ſtalks, without *ſtipulas*, one of each pair ſix times the ſize of its companion, which is obovate and nearly entire. *Flowers* monoecious, in little tufts, not capitate, on ſolitary, reddiſh, ſpreading ſtalks, from the boſoms of the terminal *leaves*, which they do not equal in length. Male *flowers* with a thick red *calyx*, and white *anthers*; female ones more numerous, and much ſmaller. Dr. Swartz mentions a dwarf variety, only an inch high, with ovate *leaves*, and extremely minute *flowers*. This is one of the very few ſpecies of which we have ſeen no ſpecimens.

51. U. *cuneiformis*. Roughiſh Wedge-leaved Nettle. Poiret in Lamarck n. 20. Willd. n. 47.—Leaves oppoſite, ſtalked, obovate-wedgeſhaped, ſerrated, triple-ribbed, minutely hairy. Flowers tufted, on ſhort axillary ſtalks. Stems ſimple, aſcending.—Gathered by Commerſon, in the iſle of Mauritius. *Root* perennial, creeping. *Stems* ſeveral, about four or five inches high, roundiſh, leafy, rather woody, and numerouſly jointed. *Leaves* almoſt an inch long, ſtrongly ſerrated except at the tapering baſe, the oppoſite ones very ſlightly unequal in ſize. *Flowers* reddiſh, few together, on lateral ſtalks, about the length of the footſtalks.

Sect. 2. *Leaves alternate.*

52. U. *lappulacea*. Bur Nettle. Swartz Ind. Occ. 317. Act. Holm. for 1787. t. 2. f. 2. Willd. n. 48.—Leaves alternate, ovate, roughiſh, hairy, entire. Flowers terminal, nearly ſeſſile. Seeds triangular. Stem diffuſe.—Very common in dry ſtony places in Jamaica, flowering in ſpring. The aſpect of the plant is like a *Parietaria*. *Stem* trailing, much branched. *Leaves* ſtalked, from a quarter to three-quarters

quarters of an inch long, somewhat hairy, not stinging, imperfectly fringed. *Stipulas* none. *Flowers* crowded between the terminal leaves, somewhat racemose, the male and female ones together, the latter sessile. *Germens* two, one to each valve, triangular. The permanent valves of the *calyx*, fringed with minute hooked bristles, attach themselves to any thing that comes in their way, and carry the *seeds* along with them. Swartz describes a sort of rough covering to the *seeds*, besides the calyx-valves, and justly remarks that this species is a very singular *Urtica*, very near the *Parietariæ* in habit; and we may add somewhat similar, perhaps, in character.

53. U. *glomerata.* Tufted-flowered Nettle. Willd. n. 49.—Leaves alternate, ovate, entire; rough above; most hairy beneath. Flowers pentandrous, nearly sessile, in axillary tufts. Stem erect, with slender elongated branches.—Native of the East Indies. Communicated by professor Willdenow himself. The *stem* is somewhat shrubby, a foot and a half or two feet high, with alternate, long, slender, angular, leafy, reddish branches, downy when young. *Leaves* numerous, scattered, stalked, from half an inch to an inch, rarely more, in length, bluntish, three-ribbed; dark green, and rough with minute points, as well as a few hairs, on the upper side; paler, and clothed with prominent bristly hairs, beneath. *Flowers* reddish, hairy, monoecious, in numerous little round tufts; the males five-cleft. The whole plant has altogether the appearance of a *Parietaria.*

54. U. *mollissima.* Silk-leaved Nettle.—Leaves alternate, ovato-lanceolate, bluntish, entire; soft and downy on both sides. Flowers nearly sessile, in axillary tufts. Stem erect, with downy branches.—Gathered by Commerson, in the isle of Mauritius. We find no description in any author answerable to this plant, though it is a very distinct species. The *branches* have a shrubby aspect, being stout, angular or furrowed; silky, and sometimes zigzag, when young. *Leaves* two inches, or two and a half, in length, ovate at the base, tapering to a blunt point, three-ribbed, of a bright light green; minutely dotted on the upper side, and very hairy on both, with soft silky pubescence. *Footstalks* one-third of an inch long, broad, very downy. *Flowers* numerous, in dense, globular, axillary tufts, intermixed with scaly *bracteas.* They appear to be all males in our specimens, but are in too young a state for precise determination. We have been inclined to suspect that this may be the *Parietaria verbascifolia* of Poiret in Lam. Dict. v. 5. 16, but the *leaves* in our specimens are all alternate, ovate, rather than lanceolate, and blunt, not sharp. It is, however, sufficiently akin to *P. arborea* of the same author, though abundantly distinct, to excite this suspicion. This *P. arborea,* (*Urtica arborea;* Linn. Suppl. 417. L'Herit. Stirp. t. 20.) is *Boehmeria rubescens,* Willd. Sp. Pl. v. 4. 344; a handsome greenhouse shrub, flowering copiously in the spring.

55. U. *rotundifolia.* Pepper-leaved Nettle. Lamarck n. 38. Willd. n. 50.—Leaves alternate, roundish-ovate, pointed, coriaceous, nearly entire, smooth; minutely dotted above. Spikes axillary, aggregate, interrupted. Flowers in round balls, with linear downy bracteas.—Gathered by Commerson, in the island of Mauritius. A fine large shrubby species, with the aspect of a Pepper-vine. The *branches* are round, smooth, hollow. *Leaves* three inches long, and two broad, with three ribs, connected on the under side by transverse parallel veins, and innumerable reticulations; the upper dotted with minute callous points. Willdenow mistranslates Poiret, so as to describe these latter on the under surface. *Footstalks* above an inch long, very smooth. *Clusters,* or *spikes,* twice that length, erect, three together, unbranched, but formed of several dense, distant, globular, many-flowered heads, interspersed with long, narrow, rusty *bracteas.* All the *flowers* appear to be female in Commerson's specimen, but we cannot clearly ascertain the generic character, so as to be free from doubt on that subject. We should gladly have named this species *monilifera.*

56. U. *heterophylla.* Various-leaved Nettle. Vahl Symb. v. 1. 76. Willd. n. 51. (U. palmata; Forsk. Ægypt.-Arab. 159. Ana-schorigenam; Rheede Hort. Malab. v. 2. 77. t. 41.)—Leaves alternate, ovate, with tooth-like serratures; the upper ones three-lobed. Clusters axillary, stalked, oblong, compound.—Native of Arabia Felix, and the East Indies. *Root* apparently annual. *Stem* simple, eighteen inches high, furrowed, spotted, bristly. *Leaves* somewhat heart-shaped, pointed, with three principal ribs, from two to four inches long, and nearly as broad. *Footstalks* bristly, shorter than the leaves. *Flowers* monoecious; the males in globose *clusters;* the females below them; their *clusters* hispid and forked when in fruit.

57. U. *æstuans.* Surinam Nettle. Linn. Sp. Pl. 1397. Willd. n. 52. Ait. n. 15. Jacq. Hort. Schoenbr. v. 3. 72. t. 388? see n. 66. (Pino, sive Urtica; Pis. Brasil. 235.)—Leaves alternate, ovate, serrated; minutely heart-shaped at the base. Clusters axillary, forked. Fruit in orbicular corymbs.—Native of Surinam. Linnæus raised it in the Upsal garden. The *root* is annual or biennial. *Herb* stinging, with a furrowed, simple, hairy *stem.* *Leaves* on long hairy stalks, larger than those of *U. dioica,* and less deeply or sharply serrated; contracted in a peculiar manner towards the base, where their two small lobes make a heart-like sinus. *Clusters* in our specimen shorter than the footstalks, forked and subdivided; in Piso's figure they are longer, and assembled about the top of the stem, as in Jacquin's plant, which latter is said to have no stinging property. Hence arises a doubt as to his synonym, which, without comparing specimens, we cannot remove. Piso speaks of his plant as powerfully stinging, and Linnæus implies the same in the specific name. The bristles on the *leaves* indeed appear constructed like those of our Stinging Nettles, but those of the *stem* look like what Linnæus terms them, "harmless prickles."

58. U. *capitata.* Many-headed Nettle. Linn. Sp. Pl. 1397. Willd. n. 53. Pursh n. 6.—Leaves alternate, heart-shaped, serrated, roughish, nearly naked. Heads of flowers globular, densely spiked. Stem smooth.—In shady woods, near rocks, from Canada to Carolina; perennial, flowering in June and July. *Pursh.* This species bears some resemblance to *U. dioica,* or rather to our *morifolia,* n. 20; but the *leaves* have three well-marked principal ribs, and are more pointed than in the latter, besides being alternate. The *clusters,* or rather *spikes,* are axillary, erect, solitary, various in length, composed of crowded or confluent heads, of sessile *flowers.* Sometimes these *spikes* assume the nature of *branches,* and terminate in a few leaves; sometimes they are much shorter than the *footstalks.* The *seeds* are ovate, with a broad tumid border.

59. U. *japonica.* Hairy Japan Nettle. Thunb. Jap. 70. Willd. n. 54.—Leaves alternate, heart-shaped, villous, unequally serrated. Flowers in globular, axillary, stalked heads. Stem downy.—Grows near Nagasaki in Japan, flowering in September and October. The cortical fibres serve to make cables for small vessels. The *stem* is square, furrowed, erect. *Leaves* an inch and a half long; paler beneath. *Footstalks* half that length.

60. U. *villosa.* Small Shaggy Japan Nettle. Thunb. Jap.

Jap. 70. Willd. n. 55.—Leaves alternate, heart-shaped, bluntly serrated, hairy, on very short stalks. Flowers in sessile, scattered, globular heads.—Native of Japan. The *stem* is herbaceous, round, hardly a span high, with alternate wide-spreading branches. *Leaves* obtuse, unequal, as long as the nail. *Heads* of flowers minute, dispersed over the branches.

61. U. *sessiliflora*. Dense-whorled Nettle. Swartz Ind. Occ. 321. Willd. n. 56.—Leaves roughish, elliptical, tapering at each end; serrated towards the point: the upper ones sometimes opposite. Clusters very short, in dense axillary whorls. Stem erect, round, nearly smooth.—Native of rocky mountainous places, in the interior of Jamaica. *Root* perennial, branched, fibrous. *Stem* a foot high, shrubby at the base, divided upwards, scarcely roughish; the branches generally, not always, alternate. *Leaves* two inches or two inches and a half long, and an inch and a quarter wide across the middle, somewhat triple-ribbed, rather fleshy; roughish on the upper side only, (not stinging,) with very minute short bristles. *Footstalks* an inch or inch and half long, smooth. *Stipulas* none. *Flowers* monoecious, very small, forming little dense whorls.

62. U. *muralis*. Arabian Wall Nettle. Vahl Symb. v. 1. 77. Willd. n. 57. (U. parasitica; Forsk. Ægypt.-Arab. 160.)—Leaves alternate, ovate, three-ribbed, downy, equally serrated. Stipulas lanceolate, pointed, distinct. Clusters very short, in dense axillary whorls.—Found by Forskall, on the walls of Coffee-gardens, in Arabia. Perennial. *Stem* a foot high, round, downy; hoary in the upper part. *Leaves* an inch and a half long, pointed, sharply serrated, clothed with soft shaggy pubescence, especially the upper ones, not stinging; entire at the base and point. *Footstalks* an inch in length. *Whorls* villous and hoary. Differs from *U. japonica*, n. 59, in the equal serratures, and even surface, of its *leaves*, as well as in its sessile heads of *flowers*. *Vahl.*

63. U. *caffra*. Caffre's Nettle. Thunb. Prodr. 31. Willd. n. 58.—Leaves alternate, ovate, somewhat heart-shaped, serrated. Flowers axillary, sessile. Stem weak, not quite erect.—Native of Southern Africa. *Thunberg.*

64. U. *ruderalis*. Otaheitè Nettle. Forst. Prodr. 66. Willd. n. 59.—Leaves alternate, ovate, somewhat heart-shaped, bluntly serrated, smooth. Panicles axillary, corymbose, divaricated, stalked, nearly equal to the leaves.—Gathered by Forster in Otaheité and the Society isles. His specimen before us is a foot long, woody, alternately subdivided, and appears to be but a branch of a shrubby *stem*, of considerable size. Willdenow, on the contrary, speaks of the stems as only a finger's length. The *leaves* are above an inch long, on long stalks; paler beneath, but we do not find them at all rough. *Panicles* on long, smooth, angular stalks. *Seeds* ovate, bordered, light brown, somewhat wrinkled.

65. U. *leptostachya*. Slender-spiked Nettle.—Leaves alternate, ovate, serrated; rough on the upper side. Spikes axillary, solitary, simple, cylindrical, downy, on stalks much longer than the leaves.—Gathered by Commerson, in the isle of Bourbon. We do not find it any where described. The *root* is perennial, creeping very extensively. *Herb* not stinging. *Stem* a foot high, or more, erect, round, simple, leafy, downy or roughish. *Leaves* scattered, an inch or inch and a half long, on slender downy and bristly stalks, half that length; their upper surface harsh to the touch; under smoother, but with hairy ribs. *Flower-stalks* erect, three or four inches long, slender, undivided, from the bosoms of the smaller upper leaves, besides a terminal one, larger than the rest; they are all naked below; minutely bracteated in the upper part; and each terminates in a dense spike of numerous sessile *flowers*, all female, as far as we can discern, in our specimen. *Calyx* ovate, turgid, downy.

66. U. *divaricata*. Wing-stalked Nettle. Linn. Sp. Pl. 1397. Willd. n. 60. Pursh n. 7. (U. racemosa major virginiana, mitior, five minùs urens; Pluk. Phyt. t. 237. f. 2, excluding the synonyms.)—Leaves alternate, ovate, roughish, strongly serrated. Clusters compound, divaricated, as long as the leaves: male flower-stalks winged, wedge-shaped.—Gathered in Canada by Kalm, whose original specimen is before us. If Mr. Pursh's plant be the same, of which there appears some doubt, we have his authority for this species inhabiting shady woods, in rocky situations, from Canada to Carolina, flowering in August. Neither Willdenow nor Poiret ever saw *U. divaricata*. Its general aspect is so like Jacquin's figure of *U. æstuans*, see n. 57, that we should suppose that figure belonged to the present species, were the very peculiar wedge-shaped, membranous-winged stalks, of the male *flowers*, there represented. These could not have escaped the observing Jacquin, though not expressed by Plukenet, whose plant may indeed be different from our's, and yet not the same with the following. The *stem* of *U. divaricata* is tawny, strongly furrowed, slightly prickly. *Leaves* three or four inches long, ovate, with a small sinus at the base, pointed, copiously and sharply serrated, on bristly *footstalks*; they have scarcely more than one principal rib; they are roughish on both sides, but especially the upper, with extremely minute points, and some scattered bristles. The *clusters* are terminal, or at least crowded about the top of the stem, several together, spreading, stout, twice compound; their common stalks bristly, as are the partial ones, more or less. Those of the *male flowers*, a quarter of an inch long, we have already described; these flowers are all past in our specimen. The *seeds* are of greater diameter than mustard-seed, nearly orbicular, oblique, compressed, smooth, brown, with a curved point; their stalks short and simple. *Calyx* very small. We hope some North American botanist will illustrate this curious species, and its synonyms.

67. U. *canadensis*. Canada Nettle. Linn. Sp. Pl. 1397. Willd. n. 61. Ait. n. 16. Pursh n. 8. Michaux Boreal.-Amer. v. 2. 178, excluding Plukenet's synonym. (U. racemosa canadensis; Dodart Mem., Amsterdam, ed. 631. t. 37. U. virginiana major racemosa mitior, seu minus urens; Moris. sect. 11. t. 25. f. 2.)—Leaves alternate, ovate, somewhat hairy, serrated. Stipulas obtuse. Clusters axillary, compound, spreading, shorter than the leaves; the lower ones male, sessile; upper female, stalked.—Near rivulets, in rocky or sandy situations, from Canada to Carolina, especially on the mountains, flowering in July and August. The *root* is perennial, reddish, rather woody, with stout fibres. *Stems* four or five feet high, annual, erect, simple, roundish, striated, slightly bristly; their fibres tough. *Leaves* three or four inches long, pointed, sometimes a little unequal at the base; slightly hairy on both sides, rather harsh to the touch, but not stinging. *Footstalks* an inch long, bristly, with a pair of rounded reddish *stipulas* at their insertion. Our Linnæan specimen is destitute of *flowers*. Dodart compares them to those of the "Common Nettle;" we presume *U. dioica*; and such is nearly their appearance in a specimen from Jacquin's old herbarium, at sir J. Banks's, marked by mistake *divaricata*; but they are more slender and branched than in *dioica*.

68. U. *hirsuta*. Hairy Arabian Nettle. Vahl Symb. v. 1. 77. Willd. n. 62. (U. divaricata; Forsk. Ægypt.-Arab.

Arab. 160.)—Leaves alternate, ovate, ſomewhat heart-ſhaped, ſerrated. Stem and footſtalks hairy. Stipulas linear-lanceolate. Cluſters compound, longer than the leaves.—Native of Arabia. The herbage has no ſtinging quality. The *ſtem* is but a foot high, moſt hairy in the upper part. *Leaves* about an inch long, acute; paler beneath, with hairy ribs. *Footſtalks* the length of the leaves. *Cluſters* axillary, ſolitary, leſs compound than in the laſt, hairy. *Flowers* tufted.

69. U. *capenſis*. Horehound-leaved Cape Nettle. Linn. Suppl. 417. Willd. n. 63. Thunb. Prodr. 31.—Leaves alternate, heart-ſhaped, crenate; downy and ſoft beneath. Cluſters axillary, erect, aggregate. Flowers faſciculated.—Gathered by Thunberg, at the Cape of Good Hope. The *ſtem* is round, erect, with ſpreading branches, ſomewhat hairy, not ſtinging. *Leaves* an inch and a half long, and nearly as broad, acute, broadly and rather ſharply crenate, ſmooth above; denſely downy and hoary beneath. *Footſtalks* downy, about as long as the leaves. *Cluſters* two inches or more in length, ſtalked, ſlender, cylindrical, unbranched, compoſed of ſmall, round, ſlightly diſtant, tufts of *flowers*.

70. U. *argentea*. Silvery Cape Nettle. Forſt. Prodr. 65. Willd. n. 64.—"Leaves alternate, elliptic-lanceolate, nearly entire; glaucous beneath. Spikes axillary, ſolitary, interrupted."—Native of the Society iſles. *Forſter*.

71. U. *nivea*. Chineſe White-leaved Nettle. Linn. Sp. Pl. 1398. Willd. n. 65. Ait. n. 17. Jacq. Hort. Vind. v. 2. 78. t. 166. (Ramium majus; Rumph. Amboyn. v. 5. 214. t. 79. f. 1.)—Leaves alternate, roundiſh-ovate, pointed, toothed, three-ribbed; ſnow-white and downy beneath. Cluſters axillary, repeatedly compound. Flowers faſciculated.—Native of China, and the remote iſlands of the Eaſt Indies. Miller appears to have cultivated this ſpecies at Chelſea in 1739, and it ſtill exiſts there, in the open border, though generally conſidered as a greenhouſe or ſtove plant. The *ſtem* is ſhrubby, erect, but little branched, three or four feet high. *Leaves* from three to ſix inches long, and three or four in breadth, on long hairy ſtalks; their upper ſurface dark-green, opaque, rough to the touch; the under clothed with ſoft, very cloſe, pubeſcence, of the pureſt moſt brilliant white, marked with three principal ribs, and many fine veins, all reddiſh or green, hairy, not downy. *Cluſters* repeatedly compound, bearing numerous ſmall round heads of *flowers*, all female in the ſpecimens we have examined. We ſee no reaſon to doubt the ſynonym of Rumphius, though Jacquin expreſſes a contrary opinion; led perhaps more by the figure, which is diminiſhed and bad, than by the deſcription. This *Urtica* is a very handſome and ſingular plant, well worthy of cultivation in warm ſheltered parts of a flower-garden, or ſhrubbery, at leaſt in our ſouthern counties.

72. U. *elata*. Jamaica Tree Nettle. Swartz Ind. Occ. 322. Willd. n. 66.—Leaves alternate, ovate, acute, ſerrated, ſomewhat briſtly. Stem arboreous. Cluſters much branched, divaricated, lateral, below the leaves. Flowers dioecious.—Native of hills in the ſouthern part of Jamaica. A *tree* about ten feet high, whoſe *trunk* is an inch or two in diameter, with a ſmoothiſh grey bark, and ſpreading branches, armed when young with ſtinging briſtles. *Leaves* on the young branches only, ſtalked, pointed, an inch or two long, with broad, ſometimes ſhallow, ſerratures; green on both ſides, and beſprinkled, more or leſs, with fine ſtinging briſtles, ſome of which are marginal. *Cluſters* on the naked parts of the branches, from above the ſcars left by the laſt year's leaves, an inch long, ſlender, briſtly. *Flowers* minute, diſtant, ſeſſile. Dr. Swartz never met with the male bloſſoms.

73. U. *caraccalana*. Broad-downy-leaved Nettle. Jacq. Hort. Schoenbr. v. 3. 71. t. 386. Willd. n. 67.—Leaves alternate, heart-ſhaped, acutely crenate; rough above; ſoft and downy beneath. Panicles lateral, leafleſs, forked, divaricated. Flowers capitate, dioecious. Stem arboreous.—Native of the Caraccas. It flowered in autumn, in the ſtove at Schoenbrun. We find an old ſpecimen, without name or place of growth, in the Linnæan herbarium. The *ſtem* is eight feet high, and an inch thick, round, woody, but light. *Leaves* on downy ſtalks, broadly heart-ſhaped, from five to eighteen inches long, copiouſly but not ſtrongly crenate, furniſhed with one principal rib, which ſends off many obliquely tranſverſe ones; green on both ſides, though the under is clothed with denſe velvet-like pubeſcence, which has rather leſs of a ſtinging property than the hairs on the *footſtalks* and young *branches*. *Panicles* from above the ſcars left by laſt year's leaves, two or three inches wide, repeatedly forked, their ſtalks white, ſmooth and tender. *Flowers* purpliſh, in ſmall round heads. We have ſeen only the males, which are four-cleft.

74. U. *baccifera*. Berry-bearing Nettle. Linn. Sp. Pl. 1398. Willd. n. 68. Ait. n. 18. Jacq. Hort. Schoenbr. v. 3. 71. t. 387. Andr. Repoſ. t. 454. Swartz Obſ. 358. (U. arboreſcens baccifera; Plum. Ic. 259. t. 260.)—Leaves alternate, heart-ſhaped, toothed, prickly as well as the ſhrubby ſtem. Calyx of the fruit pulpy.—Native of lofty ſhady mountains in South America and Jamaica; flowering in the ſtove in ſummer. A ſtout *ſhrub*, or ſmall *tree*, of a coarſe rather ſucculent habit, armed all over with copious large venomous prickles, of a conical figure. *Leaves* a ſpan long, acute, dark-green; paler beneath. *Panicles* numerous, lateral or axillary, large, drooping, lax, very much branched, with red prickly ſtalks. *Flowers* ſmall, dioecious; we have ſeen the female plant only, and conſequently no perfect fruit. The *ſtigma* is a beautiful tuft of radiating hairs. The *calyx* is permanent, ſwelling, and becoming pulpy, as the *ſeed* ripens, which is clearly expreſſed in Plumier's figure.

75. U. *ſtimulans*. Buffalo's Nettle. Linn. Suppl. 418. Willd. n. 69.—Leaves alternate, oblong, entire; contracted and ſlightly heart-ſhaped at the baſe; roughiſh on the upper ſide. Stem ſhrubby, prickly. Panicles axillary, compound, divaricated, hairy.—Native of Java, where, according to Thunberg, it is called *Buffelblad*, or Buffalo's leaf, being uſed to drive thoſe animals, by means of the large ſtings, with which the branches are armed. Of theſe ſtings we find no traces on the dried ſpecimen. The *branches* are woody, round; the young ones leafy, rough to the touch, with extremely minute points, ſuch as are found likewiſe on the foliage. The *leaves* are a ſpan long, (on ſtalks rough in a ſimilar manner, an inch in length,) furniſhed with a ſingle ſtout mid-rib, which ſends off numerous alternate, tranſverſe veins or ribs; the under ſide is ſmooth, rather pale. *Stipulas* ovate, membranous, partly hairy, deciduous. *Panicles* ſtalked, twice the length of the footſtalks, with ſomewhat racemoſe branches, clothed with numerous, apparently ſtinging, briſtles. *Flowers* ſomewhat tufted, ſmall, probably dioecious.

76. U. *laurina*. Laurel-leaved Nettle.—Leaves alternate, ovate-oblong, pointed, nearly ſmooth, with ſhallow ſerratures. Panicles lateral, divaricated, downy. Flowers capitate.—Sent by the late Mr. Chriſtopher Smith, from Amboyna. The *ſtem* is ſhrubby or arboreous, with woody ſolid *branches*, leafy at the extremity. *Leaves* deciduous,

about

about four inches long, of an elegant, somewhat elliptical, taper-pointed form, bordered with shallow serratures chiefly towards the end, and furnished, as in the last, with a single mid-rib, sending off transverse veins; the upper side is smooth to the touch, though covered with callous points, even more minute than in the preceding; the under paler, somewhat downy when young, but afterwards smooth, except the rib and veins, which are finely hairy. *Footstalks* downy and hairy, three-quarters of an inch long. *Stipulas* nearly as long, lanceolate, hairy, deciduous. *Panicles* copious, from the scars of the naked branches, left by the last year's footstalks, each of several straggling, slightly divided, racemose branches, finely downy, not hairy or stinging. *Flowers* in little round heads, all male in our specimen, four-cleft and tetrandrous.

U. cylindrica, Linn. Sp. Pl. 1396; *spicata* of Thunberg, which is *japonica*, Linn. Suppl. 418; *alienata* of Linn. Syst. Veg. which is *Parietaria zeylanica*, Sp. Pl. 1492; *interrupta*, Sp. Pl. 1398; and, as we have already said, *arborea*, Suppl. 417; are all referred by Willdenow to Boehmeria, in his Sp. Pl. v. 4. 340; see that article.

Urtica, in *Gardening*, furnishes plants of the hardy herbaceous kind, among which the species cultivated are, the Tartarian or hemp-leaved nettle (U. cannabina); the Canada nettle (U. canadensis); and the snowy Chinese or white-leaved nettle (U. nivea).

The first is a rather curious plant, rising with many square stalks to the height of five or six feet, and flowers hanging in the form of long catkins near the top parts of them.

The second sort, or Canadian nettle, has erect stalks two feet in height, and the flowers produced in the form of branching upright aments or catkins.

The third sort is perennial, with upright numerous stalks three or four feet in height, with the flowers in loose aments, the whole plant having a hoary white appearance.

Method of Culture.—These plants may be increased by parting or slipping the roots in the autumn, or early in the spring, and planting them out where they are to remain.

The third sort is rather tender, and should have a dry situation where it is warm and sheltered, or be kept in pots to be sheltered under frames, or in the green-house, during the severity of the winter season.

The two first sorts afford variety in the borders and clumps of pleasure-grounds, in assemblage with herbaceous plants, by the singularity of their manner of flowering, and the last among potted plants. They will continue for many years, especially the two first sorts.

Urtica *Errans*, in *Zoology*, the name of a sea-animal of the nature of the common urtica marina in many particulars; but as that is always fixed down to the rocks, this species is always found loose. See the next article.

It has been supposed that these creatures affected the skin with a pain like that of the stinging of nettles on touching them, and even the eyes of those who only look attentively on them; but M. Reaumur, who saw prodigious numbers of them on the coasts of Poictou, declares that he found no such property in any of them, any more than in those fixed to the rocks.

These in substance so much resemble a stiff jelly, that if they were called sea-jellies, there would want but a short additional description to make them understood. Their flesh, if it may be so called, appears of the colour as well as the consistence of a common jelly; and if a piece of one of them be taken up, the mere heat of the hand is sufficient to make it melt away into plain water. These are notwithstanding true and perfect animals; and those who have been of a contrary opinion, have not examined them with sufficient attention. There are very different figures among them; but this is owing to their being of different species; for all those of the same species are ever exactly of the same figure. One great reason of people's supposing them unorganized bodies, is, that what is seen of them about the shores is very often a fragment of a dead animal, not the whole of a living one; and no wonder if all the necessary parts of an animal could not be found in such a piece of one.

Though the generality of these animals are of the simple colour of a jelly, there are some of a greenish cast, and others which have a broad band of a beautifully purple round their extremity; and some are beautifully spotted with brown. Their figure is very well expressed by that of the head of a large mushroom; their upper surface is convex in the same manner, and this convexity is greater or less in the different kinds, as it is in the different species of mushrooms.

If one of these animals be dried in the sun in hot weather, there remains nothing of it but a substance like a thin parchment; but if one of them be boiled in water, it does not dissolve away as might have been expected, but only regularly decreases in size; and when it has become of about one-fourth of its natural bigness, it there stops the decrease, and continues nearly of that size, and after that will not melt away upon the hand.

All the creatures of this species, which we see thrown upon the shores, are found lifeless and without motion; but there is nothing wonderful in that, because the violent shocks and blows which they must have received, in being dashed against the rocks or sands by the waves, are enough to kill so tender an animal. One proof that these animals once lived, is, that all those which we find about the shores are heavier than the water, and sink to the bottom; whereas all those seen out at sea, swim upon the surface; and this could not be the case in regard to any substance heavier than water, unless kept up by some voluntary motion. This motion M. Reaumur has observed to be a reciprocal contraction and dilatation of the whole body, in the manner of a systole and diastole. In the contraction, it elevates the convexity of the body, and in the dilatation it makes it more flat; and by continually repeating these motions, it keeps above water as a man does by swimming. Mem. Acad. Par. 1710.

Urtica *Marina*, the name of a remarkable genus of aquatic animals, so called from a supposition of their affecting the skin on touching them, with a painful sensation like that of the stinging of nettles. These are animals of the lowest class, and have by many been reckoned among those creatures called zoophytes, or plant-animals, as supposed to partake of the nature of vegetables and of animals. Some of the species of this animal are found loose upon the smooth shores, and some fixed to the rocks which are always covered with water. This has given birth to a distinction of them into two classes, which is as old as Aristotle; those of the one being such as move in the open sea, called by later writers *urticæ solutæ*, and referred by Linnæus to the genus of medusa, and denominated by the common people sea-jellies and sea-blubbers (see Urtica *Errans*); and those of the others such as are fixed to rocks, and were supposed always to remain immoveably in the same place, which belong to the actinia of Linnæus. The accurate M. Reaumur has observed, however, that even these last have a power of a progressive motion, and are not doomed to an eternal residence on the same spot. The motion of these creatures is so slow, that it might easily pass unobserved by less accurate observers; this gentleman comparing it to that of the hour-hand of a clock, and adding, that a journey of an

an inch takes them up commonly between one and two hours. He obſerves alſo, that many of the ſpecies have no property of ſtinging, or cauſing any painful ſenſation on the fleſh.

Dr. Gærtner obſerves, that there is not a ſingle ſpecies of the urtica marina poſſeſſed of that ſtinging quality which the ancients aſcribed to them; their tentacula indeed feel rough and clammy, when touched with the finger; but this roughneſs is not perceptible, except when the animal attempts to lay hold of the finger; in which caſe it throws out of the whole ſurface of the feeler a number of extremely minute ſuckers, which, ſticking faſt to the ſmall protuberances of the ſkin, produce the ſenſation of a roughneſs, which is ſo far from being painful, that it even cannot be called diſagreeable.

Theſe creatures occaſionally change their bodies into ſo many different forms, that there is no giving any deſcription of their figure. The moſt natural and general ſhape ſeems that of a truncated cone, the baſe of which is applied to the rock; but this baſe is often round, often elliptic, and often of a perfectly irregular figure. The ſurface of the top of the cone is not flat, but convex, and has in its centre an aperture, which the creature makes larger or ſmaller at pleaſure. In ſome poſitions, the whole animal not unaptly reſembles a purſe, only with this difference, that the body is not drawn up into any folds or wrinkles by the cloſing of the aperture or mouth. In the middle of this purſe, as we call it, is placed the body of the creature, touching this outer covering at the bottom on every ſide, and of a conic figure, as that is. At its top, however, it is looſe, and ſtands every way free from its covering; the ſides are more or leſs diſtant from this free or looſe part of the body, as the aperture at the top of the cone is more or leſs open; when it is nearly ſhut up, very little of the body of the animal can be ſeen; but when it opens into different widths, more or leſs of the body becomes viſible; and when it is at the wideſt, every part of it, and all the horns, are ſeen perfectly diſtinct. Theſe horns reſemble in appearance thoſe of the common ſnail; but in their uſe they ſeem much more allied to the pipes or proboſcides of the chamæ kind, the animal generally throwing out water at them on being touched. They are placed in three ranges on the internal ſurface of the covering, and are very numerous, their whole number not being leſs than a hundred and fifty.

The creature very often not only opens the outer covering or purſe to the utmoſt width it is capable of, but at the ſame time turns back its extremities: in this caſe, the internal part, or body, becomes viſible on the ſurface, and at the ſame time all the horns being, by this bending back of the ſkin on which they grow, thrown into the poſture of ſo many rays, the whole makes a very remarkable figure, and not unaptly reſembles an anemony, or ſome other ſuch flower, when fully open. Very often alſo there is a great addition to the beauty of this appearance, by ſeveral round veſicles of water, which appear blue, or of ſome other lively colour. The general colour of the different ſpecies of this animal, or indeed of the ſame ſpecies in different circumſtances, is as variable as the ſhape; ſometimes they are ſeen pellucid and colourleſs, ſometimes white, often yellowiſh, ſometimes of a roſe colour; at other times, they are of a beautiful green, and often of various ſhades of brown. In ſome, theſe colours are equally diffuſed through every part; in others, they are only ſeen in form of ſpots and clouds, or variegations; ſometimes theſe are irregularly diſpoſed, ſometimes more regularly, but always with great beauty. The green ones have uſually a broad line of blue all round their baſe. Neither the colour nor ſhapes of theſe animals can be any marks of different ſpecies; but the firmneſs of their fleſh may: in this they remarkably differ one from another, and this is a difference the more obvious, as their fleſh is always open to the touch, there being no ſhell, nor any other hard ſubſtance to cover it. However ſlow the progreſſive motion of this creature is, when examined it is found to depend on a very remarkable mechaniſm, to underſtand which we muſt attentively conſider what is obvious to the eye in the ſtructure of the creature, and remember the compariſon of the whole to a purſe. We find that what reſembles the bottom of that purſe is flat, and is fixed to the rock, while the body is contained in the reſt of the purſe, but never fills it, unleſs when the mouth of the purſe or covering is cloſe drawn together. The whole covering is a collection of muſcles, which are all tubular. The baſe of the animal never appears to us, becauſe always fixed down to the rock; but when the creature is raiſed from that poſition, and the baſe examined, it appears compoſed of a vaſt number of tubes placed one behind another, and running from the centre to the circumference. Theſe tubes are often filled with an aqueous liquor, which may be forced out on preſſing them. Beſides theſe tubes, there are alſo many circular ones ſurrounding one another.

The progreſſive motion ſeems to be thus performed: when the creature has determined which way it will march, it diſtends all thoſe longitudinal tubes which are on that ſide of its body which is placed toward the point it would move to; this, from its round ſhape at the baſe, gives it an oblong one; that is, it throws the fore-part ſomewhat forward upon the rock; and, at the ſame time, if the longitudinal tubes on the oppoſite ſide of the body be all left empty, and the circular ones diſtended, theſe naturally draw the whole body toward the fore-part, and thus a ſmall advance is made and preſerved, and this, often repeated, is the ſlow progreſſion of this animal. All this is, however, performed ſo very ſlowly, that though there is a continual change going on in the creature, both as to ſhape and place, yet if the eye is kept continually on the object, neither is perceived; but if taken off for ſome time, and the place and figure both kept in mind, both will be found to be altered on viewing again.

There is a ſpecies of this animal alſo which moves by means of its horns; this is known from the reſt by the length of the horns, and their being covered with a glutinous moiſture. This ſpecies lives in the cavities and holes of rocks; and when it has a mind to move, it turns itſelf bottom upwards, and crawls ſlowly on by means of its horns, which then touch the rock.

The food of the urtica marina is not leſs wonderful than its ſtructure and motions. It ſhould ſeem very ſtrange that an animal, ſoft like this creature, with no feet nor inſtrument of that kind to help itſelf with, ſhould be able to feed on the fleſh of muſcles, ſea-ſnails, and other ſhell-fiſh; yet theſe are its conſtant food. They find means to take in the ſhell-fiſh whole into the body, and then cloſe the aperture faſt upon it, ſo that it is not to be ſeen that they have any ſuch thing within them; they keep them here as long as they pleaſe, and afterwards throw out the empty ſhells by the ſame aperture, which they can, as before obſerved, widen and contract at pleaſure. By what means the urtica is able to get out the body of theſe fiſh, is not known, as it all paſſes in the body; but it very often fails, and the creature is obliged to throw out the ſhell-fiſh alive again; and ſometimes when it has greedily gorged too large a morſel, and it is got into a wrong poſition to be thrown out the ſame way, it is obliged to let it through the baſe, where there is no natural

natural aperture, and where its paſſage muſt be attended with a terrible wound. The manner in which the larger ſhells are thrown out by the mouth, is by opening it extremely wide and turning it back, ſo that the inſide appears outward for a little way down; and this motion is alſo uſed on another very neceſſary occaſion, the excluding of the young ones, for theſe animals are viviparous. Mem. Acad. Par. 1710.

It has been found that this creature has the remarkable property of the polype, in reproducing ſuch parts as it had loſt. M. Reaumur tried many experiments on the various ſpecies of this, and of the ſtar-fiſh kind, and found that whatever parts were cut off, the wound ſoon healed; and M. de Villars had opportunities of watching the whole progreſs of the growth of the animals afterwards, and found that they not only ſeemed alive and well after cutting, their wounds ſoon cicatrizing, but that they, in a very little time, regained what had been cut off, and became as perfect as before. See *Sea*-ANEMONIES.

Dr. Gærtner refers the urticæ marinæ, or ſea-nettles, to the hydra of Linnæus, commonly called the polype; for he ſays, that they agree with that genus in the following general characters, beſides many of its leſs eſſential or accidental qualities: they are of a gelatinous ſubſtance; they have only one opening in their bodies which gives a paſſage to the food, as well as to the excrements of the animal; and they have alſo a ſet of feelers, which ſurround this opening, and ſerve theſe creatures for claws, to catch their prey with, and convey it to their mouths. Phil. Tranſ. vol. lii. art. 13. p. 73, &c.

Theſe animals were known to the Greeks and Romans by the names of πνευμα θαλασσιος, and pulmo marinus, or ſea-lungs. They attributed medicinal virtues to them. Accordingly Dioſcorides informs us, that if rubbed freſh on the diſeaſed part, they cured the gout in the feet, and kibed heels. Ælian ſays that they were depilatory, and if macerated in vinegar, would take away the beard. Their phoſphoric quality was noticed by Pliny, who ſays that a ſtick rubbed with them will appear to burn, and the wood to ſhine all over: he alſo adds, that when they ſink to the bottom of the ſea, they portend a continuance of bad weather. Pennant's Brit. Zool. vol. iv. p. 59.

URTICÆ, in *Botany*, ſo named from the great genus URTICA, ſee that article, is the 98th natural order in Juſſieu's ſyſtem, the third of his 15th, or laſt, claſs. The characters of this claſs are given under EUPHORBIÆ, where we have ventured to obſerve that the claſs is by no means a really natural one. To the order before us, though clogged with doubtful genera at the end, there is little or no exception. It is analogous to the *Scabridæ* of Linnæus, and may ſerve to give an idea of that tribe, which we have omitted in its proper place.

Juſſieu's characters of his *Urticæ* are theſe.

Flowers monoecious or dioecious, rarely united. *Calyx* univerſally of one leaf, divided. *Corolla* none. The *male flowers* with a definite number of *ſtamens*, inſerted into the calyx, oppoſite to its ſegments. *Female* ones with a ſolitary ſuperior *germen; ſtyle* either wanting, or one, or two, often lateral; *ſtigmas* often two. *Seed* one, encloſed in a brittle cruſt, or tunic, either naked, or encloſed in the calyx, which ſometimes turns pulpy. *Corculum* ſtraight or incurved, without *albumen*. The plants are either trees, ſhrubs or herbs; in ſome caſes milky. *Leaves* generally accompanied by ſtipulas, and either alternate or oppoſite. *Flowers* ſometimes ſolitary, ſometimes racemoſe; in ſome genera ſeated on a many-flowered catkin-like receptacle; in others concealed within a ſimple-leaved common involucrum. *Fruit* therefore ſometimes many-ſeeded, in conſequence of the aſſemblage of the ſeeds of numerous aggregate flowers in one involucrum or receptacle.

Sect. 1. *Flowers concealed in a common ſimple-leaved involucrum.* This contains five genera.

Ficus; Ambora of Juſſieu, which is MITHRIDATEA of Commerſon and Schreber, ſee that article; *Dorſtenia; Hedycaria* of Forſter, doubtfully placed here by Juſſieu, as he ſuſpects it may be more akin to his *Anona*, or to his *Ranunculaceæ;* and, laſtly PEREBEA of Aublet, of which we have ſpoken in its proper place, as a genus undoubtedly of this order, notwithſtanding our preſent incomplete acquaintance with its fructification.

Sect. 2. *Flowers either ſituated on a common many-flowered receptacle; or collected into heads, with involucral ſcales; or ſeparate and ſcattered.*

Cecropia; Artocarpus; Morus; Elatoſtema of Forſter, to which belongs *Procris* of Commerſon and Juſſieu, as already mentioned, ſee ELATOSTEMA; *Boehmeria* of Jacquin. Willd. Sp. Pl. v. 4. 340; *Urtica; Forſkälea; Parietaria; Pteranthus* of Forſkall, the *Louichea* of L'Heritier, Schreb. Gen. 840; *Humulus; Cannabis;* and *Theligonum.*

Sect. 3. *Genera related to Urtica.*

Gunnera, to which we have united *Miſandra* of Commerſon, ſee GUNNERA, and to which alſo the *Panke* of Feuillée undoubtedly belongs; *Piper; Gnetum* of Linnæus, from which *Thoa* of Aublet and Juſſieu cannot be ſeparated, ſee GNETUM; *Bagaſſa*, Aublet Guian. t. 376; *Couſſapoa*, Aubl. Guian. t. 362, 363; and *Pourouma* of the ſame author, t. 341; the three laſt but imperfectly known.

Ulmus and *Celtis* are reckoned by Linnæus amongſt his *Scabridæ*, but Juſſieu refers them to the *Amentaceæ; Boſca* and *Acnida*, as well as *Trophis*, are *Scabridæ* of Linnæus; Juſſieu conſiders the two firſt as *Atriplices*, and the laſt ſtands amongſt his *Plantæ incertæ ſedis*, Juſſ. Gen. 442.

URVASI, in *Hindoo Mythology*, is the name of one of the numerous race of choriſters, dancers, minſtrels, &c. attending on the gods of that polytheiſtic and poetical people. The name of Urvaſi does not often occur.

Urvaſi is to be claſſed among the Upſaras, anſwering to the Nereids of weſtern fable; as ſhe aroſe from the ocean, with Rhemba, queen of the Upſaras, and a glorious train, when churned by the gods and demons, as deſcribed in the article KURMAVATARA.

URUBU, in *Ornithology.* See VULTUR.

URUBUARA, or URUBA-CUARA, in *Geography*, a town of the Braſils, on a river of the ſame name, at its union with the Amazons; 90 miles W. of Para.

URUBUI, a river of Braſil, which runs into the Amazons river; 100 miles above Pauxis.

URUCUYA, a river of Braſil, which runs into the St. Francis, S. lat. 15° 20′.

URUGNAY, a river of South America, which riſes about S. lat. 26° 30′, and runs into the river Plate, S. lat. 34°.

URUGUNDI, in *Ancient Geography*, a people of Scythia, on the bank of the Danube. Zoſimus.

URUMEA, in *Geography.* See URMIAH.

URUNCÆ, or URUNCIS, in *Ancient Geography*, a place of Germany, between Arialbinum and Mons Briſacus. Anton. Itin.

VRUNDI, in *Mythology*, one of the wives of the Hindoo deity *Kriſhna;* which ſee.

URUP, in *Geography.* See URJUP.

URUS, a lake of Ruſſia, in the government of Archangel; 48 miles N. of Schenkurſk.

URUS,

Urus, in *Natural Hiſtory*, the name of a ſpecies of wild bull, of a very remarkable ſize and ſtrength. Cæſar, in his Commentaries, has deſcribed them as little inferior to elephants in ſize, and reſembling the bull in ſhape, figure, and colour. He adds, that they were very ſwift and fierce, and had horns very much larger, and very different from thoſe of the common bull. And Mentzelius tells us, that it is a vaſt and terrible ſpecies of wild bull, common in Livonia, &c. and that when killed its brain is found ſcented like muſk. Mr. Ray wiſhes very much, that ſome one, who has an opportunity of ſeeing this creature, would give a more accurate and perfect account than thoſe we already have of it.

This animal is the bos ferus of Pliny, the bonaſus and the biſon of Pliny, Geſner, Aldrov. and Linnæus, the bos taurus of the Linnæan ſyſtem with round horns curving outer, and looſe dewlap; and it is the ſpecies of Bos from which the ſeveral races of cattle have been gradually derived. It is found wild in many parts both of the old and new continent, inhabiting woody regions, and attaining to a ſize much larger than that of the domeſticated or cultivated animal. In his wild ſtate, the biſon was diſtinguiſhed, not only by his bulk, but by the ſuperior depth and ſhaggineſs of his hair, which, about the head, neck, and ſhoulders, is ſometimes ſo long as to touch the ground; his horns are rather ſhort, ſharp-pointed, extremely ſtrong, and ſituated at a diſtance from each other at their baſis, like thoſe of the common bull. His colour is ſometimes a dark blackiſh-brown, and ſometimes rufous-brown; his eyes are large and fierce; his limbs are very ſtrong, and his whole aſpect extremely ſavage and gloomy. The principal European regions where this animal is now found, are the marſhy foreſts of Poland, the Carpathian mountains, and Lithuania. Its chief Aſiatic reſidence is the vicinity of Mount Caucaſus; but it is alſo found in other parts of Aſia. The American biſon differs in no reſpect from the European, except in being more ſhaggy, and in having a more protuberant bunch over the ſhoulders; the fore-parts of the body are very thick and ſtrong; the hinder parts comparatively weak. The colour of the American biſon is a reddiſh-brown; and the hair in winter is of a woolly nature, falling down over the eyes, head, and whole fore-parts of the animal. In ſummer, it often becomes wholly naked, particularly on the hinder parts of the body. It grows to a vaſt ſize, and has been found to weigh 1600, and even 2400 pounds; nor can the ſtrongeſt man lift one of the ſkins from the ground. It has been a queſtion of difficult ſolution, how theſe animals migrated from the old to the new world; but it was probably from the north of Aſia, which anciently might have been ſtocked with them, though they are now extinct in thoſe regions. At that time, the two continents might have been united between Tſchutkinoſs and the oppoſite headlands of America; and the many iſlands that lie off that promontory, with the Aleutian or New Fox iſlands, ſomewhat more diſtant, might be fragments of land, which joined the two continents, and formed their inſular ſtate by the mighty convulſion which divided Aſia and America.

The American biſon is found in the regions 600 miles W. of Hudſon's Bay, and this is its moſt northern reſidence. From thence theſe animals occur in large droves as low as Cibola, in lat. 33° a little N. of California, and alſo in the province of Mivera, in New Mexico; and immediately to the S. of theſe parts the ſpecies ſeems immediately to ceaſe. They alſo inhabit Canada, W. of the lakes, and more abundantly the rich ſavannas which border the river Miſſiſſippi, and the large rivers that flow into it from the W., in Upper Louiſiana, where innumerable herds of them are ſeen, intermixed with thoſe of ſtags and deer; feeding chiefly in the morning and evening, and retiring into the ſhade of the lofty rocks which border the rivers during the heat of the day. They are very wild, and fly from mankind; but if wounded, they become furious, and purſue their enemy.

The chace of theſe animals conſtitutes a favourite diverſion of the Indians, and they are killed either by ſhooting them, or by gradually driving them into a ſmall ſpace, by ſetting fire to the graſs round the place where a herd is feeding. They are much terrified by fire, and crowd together to avoid it: they are then killed by bands of Indians, without any perſonal hazard. On ſuch occaſions, it is ſaid that 1500 or 2000 have ſometimes been killed at a time. The fleſh is uſed as food, and the ſkins and hair as commercial commodities, which latter, being of a woolly nature, may be ſpun into cloths, gloves, &c. that are very ſtrong, and appear as if manufactured from the beſt wool. The fleece or hair of one of theſe biſons has been known to weigh eight pounds. Theſe animals are not domeſticated by the Indians, who have long lived in a ſavage ſtate, and ſubſiſt chiefly by the chace. The common ox is the biſon reduced to a domeſtic ſtate. (See Ox and Cattle.) The Indian ox is a variety found in many parts of India, and the Indian and African iſlands: it is of a reddiſh colour, very large ſize, and diſtinguiſhed by a very large protuberance above the ſhoulders. (See Zeba.) The looſe-horned ox is found in Abyſſinia and Madagaſcar, and is diſtinguiſhed by its pendulous ears, and horns attached only to the ſkin, ſo as to hang down on each ſide. The boury is a native of Madagaſcar and ſome other iſlands, and is of the ſize of a camel, and of a ſnowy-white colour, with a protuberance on the back. The ox of the iſland of Tinian is of a white colour, with black ears. Pennant's Arctic Zool. and Shaw's Zoology.

VRY, in *Geography*, a town of France, in the department of the Moſelle; 8 miles N.E. of Metz.

URZAN, in *Ancient Geography*, a town of Aſia, in the interior of Suſiana. Ptolemy.

URZUM, in *Geography*, a town of Ruſſia, in the government of Viatka; 72 miles S. of Viatka.

USA, a town of Japan, in the iſland of Ximo; 22 miles S.S.E. of Kokura.

Usa *Baſi*, a lake of Aſiatic Turkey, in Natolia; 5 miles E. of Palatſka.

USAD, a town of Ruſſia, in the government of Viatka; 16 miles S. of Malmiſch.

USADIUM Promontorium, in *Ancient Geography*, a promontory of Africa, in Mauritania Tingitana, on the coaſt of the weſtern ocean.

USAGE, in *Law*. See Prescription and Custom.

Usage, in *Language*. See Language.

Usage, *St.*, in *Geography*, a town of France, in the department of the Sâone and Loire; 3 miles N. of Loudun.

USALITANUM Oppidum, (*Jalloulah*,) in *Ancient Geography*, an ancient town in the interior of Africa, mentioned by Pliny, ſituated W.S.W. of Adrumetum.

USANAS, in *Aſtronomy*, a Hindoo name of the planet Venus, more commonly called *Sukra;* which ſee.

USANCE, Uso, in *Commerce*, is a determinate time fixed for the payment of bills of exchange, reckoned either from the day of the bills being accepted, or from the day of their date; and thus called, becauſe regulated by the uſage and cuſtom of the places on which they are drawn. See Bill *of Exchange*.

Bills of exchange are drawn at one or more uſances, either from ſight, or from date. The Italians ſay, *uſo doppio*, for *double uſance*, or *two uſances*.

This term is longer or shorter, according to the different countries. In France, the usance for bills drawn from Spain and Portugal, is sixty days date; from other countries, thirty days date. Bills are generally drawn on Amsterdam, Cadiz, Genoa, Hamburgh, Leghorn, London, Madrid, Naples, and Venice, at sixty days date. Marseilles, however, draws on Genoa at thirty days, and on Leghorn and Naples, at forty-five days date. Ten days grace are allowed on bills payable at one or more usances, at so many days date or sight, or on a specified day; but bills drawn *à vue* must be paid on being presented. Bills made payable at a fair must be settled on the last day, or on the very day, if the fair lasts only one day.

At London, the usance for bills drawn from Holland, Germany, or France, is one month; from Spain and Portugal, two months; and from Italy, three months; all after date.

At Amsterdam, the usance is, for all Germany and Switzerland, fourteen days sight; Dantzic, Konigsberg, and Riga, one month's sight; Antwerp, Geneva, London, and Paris, one month after date; Italy, Spain, and Portugal, two months after date. Six days of grace are allowed for the payment of bills of exchange; but the general practice in Amsterdam is, that bills payable in banco be presented for payment the very day on which the written term is expired. At Antwerp, the usances and days of grace are the same as at Amsterdam. Bills drawn at sight must be paid within twenty-four hours after having been presented.

At Augsburg, the usance is fifteen days; half usance, eight days; double usance, thirty days; one and a half usance, twenty-three days, after acceptance. Bills have from one to eight days of grace; for such as fall due on the Tuesday must be paid the next day, but such as fall due on the Wednesday are not paid till that day week: however, bills drawn *à vista*, or at sight, must be paid within twenty-four hours after being presented, and also any other bills which are not presented until after the Wednesday subsequent to the day on which they become due.

At Bergamo in Italy, the usance is the same as at Venice for foreign bills; but for bills drawn from Zurich, it is fifteen days after acceptance. Bills payable *à vista*, or sight, must be paid on being presented; those that are at some days sight, or at usance, must be paid on the very day they become due, no days of grace being here allowed.

The usance for bills drawn on Berlin is fourteen days after acceptance. Berlin draws on Amsterdam, Breslau, Hamburgh, and Leipsic, at four or five weeks date, and at sight, on London and Paris, at two months date; the days of grace by the edict of 1751 are three.

At Bern in Switzerland, there is no law or custom respecting usance, nor are any days of grace allowed. At Bologna bills of exchange are paid in banco, except when they are expresly drawn in money Fuori banco, or when the acceptor and holder of the bill both agree that they shall be paid in currency; in the latter case, the payment is regulated by the Agio on banco. Bills drawn on Bologna from other parts of Italy are usually paid eight days after acceptance, in which neither the day of acceptance nor the day of payment is included. No other days of grace are allowed. Bills payable after date, or on a determined day, must be paid the first day after their written term. Bills drawn on Bolsano, or Botzen in the Tyrol, are mostly payable at the fairs; nor have any regulations been made with regard to the usance or days of grace. At Bremen, the usance for bills drawn from several parts of Germany, is fourteen days sight; from London and Paris, one month after date: the days of grace are eight; but for promissory notes and bills at short sight no days of grace are allowed.

The usance for bills drawn on Breslau is fourteen days after acceptance; half usance, eight days; and the days of grace are three. For bills, however, payable at the fairs, two of which are held every year by a royal edict of 1742, no days of grace are allowed; but such bills must be settled on the last day of payment in those fairs, or else be protested. Breslau draws on Amsterdam and Hamburgh at sight, or at four or five weeks date; on Berlin and Konigsberg at sight, or eight or twelve days date; on Vienna, Leipsic, and other parts of Germany, at usance of fourteen days sight: on Paris and London, at two or three months after date.

At Brunswick, the usance is fourteen days after acceptance. Three days are allowed to the holder of a bill to present it for payment; but no days of grace are allowed to the acceptor. At Cadiz, the usance is, for bills drawn from France, one month after date; but two months for bills from all the rest of Europe. Six days grace are allowed, on the last of which bills must be either paid or protested.

In Castile, a province of Spain, the usance for bills drawn from London, Paris, or Genoa, is sixty days; from Amsterdam, two months; and from Rome, three months after date.

Foreign bills, when they are accepted, have fourteen days grace allowed, except bills drawn from Rome, which, as well as bills that have not been accepted, must be either paid or protested on the very day on which they are made payable. Bills drawn from Bilboa are allowed nineteen days; and from other parts of Spain, eight days grace. Bills at sight must be paid when presented. At Cologne, the usance is fourteen days sight; six days grace are allowed; and if the sixth should fall on a Sunday, or holiday, the bill must be either paid, or protested, on the first day of business following.

Bills between Constantinople and the principal trading places of Europe are commonly drawn at thirty-one days sight; but from one place in Turkey on another, at eleven days sight. Some European merchants pay their bills on the very day on which they become due; and others take as many days grace as are allowed in their respective countries.

At Copenhagen, there is no established usance; but bills are made payable on a certain day. Eight days grace are allowed; and if bills be not paid within that time, they may be protested immediately, and the protest cannot be delayed beyond the tenth day; otherwise the holder of the bill is to bear all risks and expences. The days of acceptance and protest, as also Sundays and holidays, are included in the ten days; but in Altona, bills may be protested on the eleventh day.

At Dantzic, the usance is fourteen days after acceptance, and the days of grace are ten; and when the tenth day falls on a Sunday or holiday, the bill must be paid on the preceding day. But bills at sight, or such as are protested, after the days of grace are elapsed, must be either paid or protested within twenty-four hours after being presented, which may be done even on a Sunday. Bills at fourteen days sight have three days grace allowed. Bills drawn in Dantzic cannot be negociated there a second time, but must be remitted by the first holder to the place on which they are drawn.

In India, the business of exchange is chiefly carried on between the three presidencies; namely, Bengal, Madras, and Bombay: which draw on each other at various dates, and mostly in the denomination of money of the place where the bill is to be paid; but as there is always the greatest demand for

for bills on Bengal, being considered the capital of the English possessions in India, the course of exchange is mostly in favour of that place.

London draws on Bengal in current rupees at 2*s.* more or less; or in sicca rupees at sixteen *per cent.* above current; also on Madras in pagodas at 7*s.* 6*d.* more or less; and on Bombay in rupees at 2*s.* 2*d.* more or less.

Such bills are mostly at sixty or ninety days sight; but bills from those places on London are generally drawn at six, nine, or twelve months sight; in which case the sicca rupee is valued at 2*s.* 6*d.*, the pagoda at 8*s.*, and the Bombay rupee at 2*s.* 4*d.* sterling, more or less.

The bank of Bengal has been incorporated by a charter for seven years, granted under the governor-general in council, by virtue of the authority vested in him by the act of the 47 Geo. III. c. 28.

The capital of the bank is 5,000,000 sicca rupees, that is, 50 lacks. It is divided into 500 equal shares, 100 of which belong to the government, and the other 400 to individuals.

The interest of money in India fluctuates from eight to twelve *per cent. per annum*, and it has been even higher; but the bank, which engages not to charge above twelve, has already lowered the rate of interest, and has in many other respects rendered essential service to trade and commerce.

Bills drawn from Rome, or Venice, on Florence, are accepted on Saturday, and paid on that day fortnight; but bills from Bologna, accepted on Saturday, must be paid on the next Saturday following, or be protested on the same day. The usance with other places is the same as in Leghorn. Florence has no days of grace; but a bill must, on the day it becomes due, be paid or protested before the departure of the post for the place where it was drawn.

Bills drawn on Frankfort at one usance (*i. e.* fourteen days after acceptance), also bills drawn at four days or more after sight, or after date, have four days grace allowed, besides Sundays and holidays. But when a bill has no acceptor, or when it is payable by the drawer himself, if not honoured when due, and if the first indorser, or the person to whose order the bill is drawn, refuses to accept it, the bill must be protested on the day when it becomes due. Neither are any days of grace allowed on bills à vista (at sight), or at less than four days sight or date. All such bills must be paid within twenty-four hours of the specified time.

The usance of bills drawn on Geneva from Holland, England, and France, is one month of thirty days; from Germany and Italy, fifteen days sight. In defect of payment on the maturity of a bill, it must be protested on the fifth day afterwards, exclusive of Sundays. Geneva draws on Amsterdam, Paris, and London, at three months, and sometimes at two months date; on Genoa, Leghorn, Milan, and Turin, at eight days sight; on Lyons, at sight and at the payments. The usance for bills drawn on Genoa from Amsterdam, Spain, and Sicily, is two months, and from London and Lisbon, three months after date; from Naples, Ancona, and Trieste, three weeks sight; Venice and Rome, fifteen days; Augsburg and Vienna, fourteen days; Leghorn, Milan, and Turin, eight days sight. Thirty days are allowed to the holder of a bill to demand payment; but no days of grace are allowed to the acceptor. A bill may be presented on the next day after it becomes due, though it is usual to delay the protest till the first post day for the place from which the bill came.

The usance for bills drawn on Hamburgh from all parts of Germany is fourteen days sight; when bills are drawn at usance, the day of acceptance is reckoned for the first; but when at any other number of days after sight, the day after acceptance is reckoned for the first. The usance for bills drawn from England, France, and Holland, is one month; from Spain, Portugal, Trieste, and Italy, two months, after date. Twelve days of grace are allowed for payment, or protest; the day on which the bill would become due, if no grace were allowed, is reckoned for the first day; and Sundays and holidays are also included in the twelve days.

The exchanges of Ireland are chiefly with England. The par of exchange is as their monies; that is, 100*l.* English = 108*l.* 6*s.* 8*d.* Irish; but the course of exchange has been known to vary from 105 to 120 *per cent.* Of late years, the price has been between 109 and 113. Bills on Dublin are mostly drawn at twenty-one days sight, or, what is considered as equivalent, at thirty-one days date, and such are called "bills in course." If the term be longer, an advance is accordingly made in the price of exchange. Thus, bills at forty-one days date are charged one-eighth *per cent.* more; but, beyond this term, the advance is in a higher proportion, being at the rate of half *per cent.* per month. Days of grace, and all other usages and laws of exchange, are the same in Ireland as in England, except that when a bill becomes due on Sunday, it is not customary here to present it on the preceding Saturday, as in England, but on the Monday following.

At Konigsberg, the days of grace are three, as at Berlin.

The usance at Leghorn for bills drawn from Amsterdam, Antwerp, Cadiz, Madrid, Cologne, and Hamburgh, is two months after date; from Paris, Lyons, and Marseilles, thirty days after date; from London and Lisbon, three months after date; from Augsburg and Vienna, twenty-two days after date; from Venice, Cremona, Bergamo, Brescia, Modena, and Naples, twenty days after date; from Bologna, Ferrara, Lucca, Florence, and Pisa, three days sight; from Genoa, Milan, and Turin, eight days sight; from Sicily, one month sight, or two months date; from Sardinia, one month sight; from Perugia, five days sight; from Tarento, Bari, and Lecce, twenty-seven days sight; from Rome, ten days sight, or fifteen days date; from Ancona and Rimini, ten days sight; from Switzerland, eight days sight. No days of grace are allowed on bills; but they are paid three times a week at the "Stanza," a place where merchants meet on Mondays, Wednesdays, and Fridays, from eleven in the forenoon till half past two in the afternoon: thus, bills which become due on Tuesdays, Thursdays, or Saturdays, are not payable till the following days of meeting and payment.

At the fairs of Leipsic, three of which are held every year, and each fair lasts fourteen days, bills are presented for acceptance in the four first days of the fair; and the acceptance can be delayed, at new-year's fair, which begins on the 1st of January, only till the day before the second proclamation; but at the other two fairs, *i. e.* the Easter and Michaelmas fairs, till the Friday in the first week, at ten o'clock in the forenoon at the latest; and if the acceptance should not then have taken place, the bills must be protested. The time of payment of bills of exchange is during the five first days after the close of the fair is proclaimed; so that, at new-year's fair, payment must be made on the 12th of January at the latest; and at the other two fairs, on the Thursday in the second week; in default of which, the bills must be then protested before ten o'clock at night, or all resource is lost against the drawer.

The usance in Leipsic is fourteen days after acceptance. No days of grace are allowed here; but on the day a bill becomes due, the holder must demand payment; and in

case

case of non-payment, he is not permitted to connive at any delay, but must, on the very day, have it protested, with interest, expences, &c. and return the bill the first opportunity. If he neglects any of these regulations, he loses all claim on the drawer and indorsers. Bills payable à vista, or on demand, may be presented and accepted even on a Sunday or holiday, and must be paid within twenty-four hours after acceptance.

The usance at Lisbon for bills drawn from Spain is fifteen days sight; from London, thirty days sight; from Germany and Holland, two months after date; from France, sixty days ditto; from Italy, and also Ireland, three months after date. Six days of grace are allowed on foreign bills, when they have been accepted; but unaccepted bills must be either paid or protested on the very day when they become due. Bills drawn from any part of the Portuguese dominions, both in Europe and in other parts of the world, are allowed fifteen days grace.

In London, the usance for bills drawn from Holland, Germany, or France, is one month; from Spain and Portugal, two months; and from Italy, three months; all after date. Three days grace are allowed on all bills payable at usance, or after date, or at so many days sight; but if the third day should fall on a Sunday, payment must be made on the preceding Saturday. Bills at sight, or on demand, must be paid on the day when they are presented.

At Lubec, usances are the same as at Hamburgh; and ten days grace are allowed.

The usance, and all other regulations respecting bills of exchange, in Lucca, are the same as in Leghorn.

The usance at Marseilles, for bills drawn from Spain and Portugal, is sixty days; and from other countries, thirty days after date. Bills at sight must be paid on being presented, and the payment of other bills may be claimed on the next day after their term is expired; but it is not customary among the merchants to demand payment till a few days after, and the bills are not protested till the ninth or tenth day. This is also with regard to notes payable to order, for value received in merchandise.

The usance at Milan, for bills drawn from Genoa, Leghorn, Piedmont, and all Lombardy, is eight days sight; from Rome, Florence, Augsburg, Vienna, and all Germany, fifteen days sight; from Venice, twenty days date; from Naples and Sicily, twenty days sight; from France and Savoy, one month after date; from Spain, Holland, and Flanders, two months; from London, three months after date; the month always reckoned at thirty days. Bills at sight must be paid on being presented; bills payable at usance, or some days after date or sight, must be paid the day after their written term; and if this should fall on a Sunday or holiday, payment is to take place on the next working day. Accordingly no days of grace can be claimed at Milan; yet the holder of the bill may grant to the acceptor of it three days; in which case, however, the bill must be carried to the notary of the chamber of commerce, who writes upon it "seen on such a day;" and when the bill is afterwards accepted, the acceptance is to be dated from the day on which it was first presented; but if refused, the protest is to take place on the day marked by the notary. The same grace may be allowed with regard to payment, when the bill becomes due; but any delay is always at the option of the holder.

The usance in Naples, for bills drawn from any part of the kingdom of Naples, is fifteen days after acceptance; and from Sicily, Genoa, Venice, Leghorn, and Rome, twenty-two days; from Spain, two months after date; and from London, three months. The acceptance is to take place on the Saturday after the arrival of the post from the place where the bill was drawn. But bills payable at so many days sight or date must be accepted or protested on being presented, without any delay. Three days grace are allowed, except for bills at sight.

The usance at Novi, in Italy, for bills on Genoa, Milan, and Bergamo, is twenty days from the clearing day; on Florence, Venice, Rome, Lucca, and Bologna, twenty-five days; on Naples, Valencia, and Barcelona, thirty-days; on Palermo, Messina, and Madrid, forty-five days; on Lisbon and Seville, two months; all reckoned from the clearing day inclusive. No days of grace are allowed.

At Nuremberg, the common usance for bills of exchange is fifteen days; half usance, seven days; double ditto, thirty days; one and a half ditto, twenty-three days; all reckoned from the day after acceptance. When bills are payable after date, the time is reckoned from the day after that on which the bill was drawn; Sundays and holidays, and vacations of the bank, are included. When bills are made payable at one or more months after date or sight, they become due on the same day of the month on which they were drawn or accepted. Six days grace are allowed; but none on bills at sight, or two, three, or four days sight, or at a shorter date than half usance. If a bill payable after date should not arrive until after some of the days of grace are elapsed, these days are not to be reckoned from the arrival of the bill, but from the day on which it is made payable; and if all the six days should be elapsed, the bill must be paid within twenty-four hours of its arrival.

The usance at Prague is fourteen days after acceptance; and three days grace are allowed, as in all the Austrian dominions.

Rome draws on Amsterdam, Ancona, Bologna, Florence, Genoa, Leghorn, London, Lyons and Paris, Madrid, Milan, Naples, and Venice, at usance, which is three weeks after acceptance; but bills on Paris are drawn at thirty-five or forty days after date. Bills drawn on Rome at usance from any part of the ecclesiastical states are accepted on the Wednesday or the Saturday; bills from foreign parts are generally accepted on the Saturday in the week in which they are received, except those from the kingdom of Naples, which are accepted on the Friday. Protests for non-acceptance or non-payment are to take place on those days. The usance is properly two weeks after acceptance, and it has been the constant practice of bankers to pay their bills at the expiration of the fourteen days; a week of grace however is allowed, and merchants and all other traders, except bankers, avail themselves of it. This week is understood in the following manner:—Bills accepted on a Friday or Saturday, are paid twenty-one days after acceptance; but the period for bills accepted on a Wednesday is only eighteen days. Bills drawn at so many days sight must be paid on the day their written term expires.

At Rotterdam, six days grace are allowed; and when bills become due during the time the bank remains shut, it is not usual to demand payment until the third day after the opening.

Bills drawn in Russia, which are payable after date, are allowed ten days grace; but if payable at sight, three days only: Sundays and holidays are included in both cases. Payment must be demanded in the morning of the day the bill becomes due; and in case of non-payment, the protest should take place at latest on the following day. The ten days grace are allowed, even though the written term of the bill should be elapsed before it is presented or accepted. But bills payable at so many days after sight, are not allowed any days of grace; and if the acceptance be delayed, the term

term is reckoned from the day on which the bill was presented. See Russia.

At St. Gall, in Switzerland, usance is fifteen days; double usance, thirty days; half usance, eight days; the day of presentation being reckoned the first. Three days grace are allowed on bills drawn at usance, but two only on bills payable at a longer or shorter term than usance. Sundays and holidays are always included.

The days of grace, and other customs and laws relating to bills of exchange, are the same in Scotland as in England.

Bills are drawn in Sicily on Leghorn and Genoa, at usance of one month after acceptance, or at two months date, or at a few days sight; on Rome, Venice, and Naples, at eight or fifteen days sight; on London, at three months date. The usance for foreign bills, drawn on Palermo and Messina, is twenty-one days sight, including the day of acceptance; the usance for bills between Messina and Palermo is four days after acceptance. No days of grace are allowed here in any case.

The usances and days of grace vary in different parts of Spain; thus, at Madrid and Seville, the usance for bills drawn from England, France, Genoa, and Leghorn, is sixty days after date; from Amsterdam, Hamburgh, and other places in the north of Europe, two calendar months.

At Cadiz, the usance from France is one month after date; and from the other parts of Europe, sixty days.

At Bilboa, the usance from France is one month, and from the other parts of Europe, two months after date.

At Barcelona, the usance for all foreign bills is sixty days after date.

In all parts of Spain, the usance for bills drawn from Rome is ninety days after date, without any days of grace.

The days of grace for all other bills drawn on Madrid, Seville, Bilboa, and Barcelona, are fourteen days, provided the bills be accepted before they become due, otherwise no days of grace are allowed. Such bills must be protested immediately.

At Cadiz, six days grace are allowed in all cases.

In drawing bills of exchange upon Spain, it has become necessary, of late years, to write "payable in effective, and not in vales reales," otherwise they may be paid in this paper, which is generally at a discount.

The usance at Stettin, in Prussian Pomerania, for bills drawn from London and France, is one month; from Amsterdam, six weeks; from Hamburgh, four weeks, after date. Stettin draws generally on Amsterdam, Copenhagen, and Hamburgh, at six or eight, or sometimes three or four weeks date; on England and France, at two months date. The days of grace are three, as in Berlin.

The usance at Strasburg, for bills from Germany, is fifteen days after sight; and from France thirty days after date. The acceptor of a bill cannot claim any days of grace; but the holder may allow ten days, after which the bill must be either paid or protested.

The usance in Sweden is reckoned at one month after sight. Six days of grace are allowed for the payment of bills, Sundays and holidays included; if the sixth day, however, should fall on a Sunday or holiday, the bill must be paid on the preceding day; but those six days are not understood to be granted, except in cases of necessity; and a person who wishes to preserve his credit, must not claim any days of grace, but pay his bills on the day they are made payable.

Bills payable on demand, or at two or three days sight, are not allowed any days of grace; bills payable in the middle of a month become due on the fourteenth, whatever may be the number of days in that month; and the six days of grace are allowed.

When a bill, payable after date, is not presented till two or three days after its written term is expired, no more days of grace are allowed than may remain unelapsed at the time of presentation.

The usance at Turin, for bills drawn from London, is three months after date; from Holland, two months; and from France, one month. The period allowed for the payment of bills drawn from any other country besides the foregoing, begins on the day they are presented for acceptance, and ends on the day when an answer can be had, by the regular post, from the place where the bill was drawn or negociated. Hence the usance for bills drawn in Geneva, Genoa, and Milan, is commonly reckoned at eight days after sight; for those drawn in Venice, Florence, Leghorn, Rome, Augsburg, and Vienna, at fifteen days sight; and for those drawn in Naples and Sicily, at twenty-one days sight.

The presentation for acceptance of a bill payable at a determined period, cannot be delayed beyond two months after the date of the bill. The same regulation is observed with regard to claiming the discharge of a bill payable at sight; if it is not claimed within that period, it is supposed that the necessary steps have not been taken to obtain payment.

The day on which a bill is dated is always reckoned in the term it has to run.

The holder of a bill, payable after date, is at liberty either to demand payment when it becomes due, or to wait till the fifth day; and if this should fall on a Sunday or holiday, payment is to take place on the next following day of business; but bills at sight must be paid when presented.

The usance at Venice, for bills drawn from London, is three months after date; from Amsterdam, Antwerp, and Hamburgh, two months; from Bergamo, Milan, Modena, and Mantua, twenty days after date; from Augsburg, Frankfort, Genoa, Naples, Bari, St. Gall, Nuremberg, Bolsano, and Vienna, fifteen days after acceptance; from Rome and Ancona, ten days after acceptance; from Bologna, Ferrara, Lucca, Florence, and Leghorn, five days after acceptance.

Bills are allowed six days grace, after which they must be either paid or protested; Sundays or holidays are not included. Formerly payment could not be claimed, nor a bill protested, during the time the bank remained shut, except in case of a bankruptcy; and if two or three of the days of grace had elapsed before the bank was shut, the remaining days were reckoned after the opening, so as to make six days in all.

Protests are made by the fanti or clerks of the commercial college, who enter all the bills they have protested in a book, to which every merchant has free access. Thus many bills, which would otherwise be returned, are accepted and paid for the honour of the drawer or indorser. This practice is likewise useful in giving early notice of approaching insolvency.

At Vienna, the following regulations are established for bills of exchange:—

When the written term of a bill is expired, three days of grace are allowed; and if the bill should not be paid by five o'clock on the third day, it must be immediately protested and returned. In these days of grace, Sundays and holidays are included; but if the day of payment should fall on a Sunday or holiday, the bill must be paid on the next following day of business. This allowance of three days, however, is only made in order that the holder of a bill, if

he should not be able to demand payment sooner, may have the advantage of that delay; but a good payee will not avail himself of the days of grace, in order to delay the payment of a bill beyond the written term.

If a bill which is not duly paid is not protested immediately, as above, the holder has no recourse except against the acceptor.

Bills drawn at sight, or on demand, or at less than seven days sight, or date, are not allowed any days of grace, but must be paid within twenty-four hours at the latest, unless they fall due on a Sunday or holiday.

Usance is fourteen days after acceptance; half usance, seven days; one and a half usance, twenty-one days, including Sundays and holidays; but the day of acceptance is not included.

Bills payable *medio mense* (in the middle of the month) are reckoned due on the fifteenth, and are allowed, like other bills, three days grace, if necessary.

The usance at Zurich, for bills drawn from Amsterdam, or any part of Germany, is fourteen days after sight. No days of grace are allowed. The exchanges at Zurzach in Switzerland, in which there are two great fairs annually, are regulated by those of Zurich. Kelly's Cambist, vol. i. passim. See EXCHANGE and BILLS *of Exchange*.

USBEKS, in *Geography*. See UZBEKS.

USBIUM, in *Ancient Geography*, a town of Germany, near the Danube. Ptolemy.

USCHEAU, in *Geography*, a town of Bohemia, in the circle of Boleslaw; 5 miles N.W. of Nimburg.

USCHECH, a town of Arabia, in the province of Yemen; 10 miles S.E. of Chamir.

USCOKAN, a small island in the East Indian sea, near the south-west coast of Borneo. N. lat. 6° 21′. E. long. 116° 25′.

USCUDEMA, in *Ancient Geography*, a town of Thrace, belonging to the Bassi, taken by Lucullus.

USCUP, in *Geography*. See SCOPIA.

USDAW, a town of Prussia, in Oberland; 7 miles N. of Soldau.

USDICESICA, in *Ancient Geography*, a prefecture of Thrace, on the side of the two Mœsias, in the vicinity and to the W. of mount Hæmus. Ptolemy.

USE, in *Geography*, a river of Germany, which runs into the Nidd, near Assenheim.

USE, *Usus*, in *Law*, denotes the benefit or profit of lands and tenements.

Use imports a trust and confidence reposed in a man for the holding of lands; that he, to whose use or benefit the trust is intended, shall reap the benefits of it.

A deed consists of two principal parts; the *premises*, which include all that comes before the habendum, or limitation of the estate; and the *consequent*, which is the habendum itself; in which there are two limitations; the one of the *estate*, or property the party shall receive by the deed; the other of the *use*, expressing to or for what use and benefit he shall have the same.

Uses, some say, were invented upon the stat. of Westminster, *Quia emptores terrarum*; before which time no such uses were known. And because, in course of time, many deceits got footing, by settling the possession in one man, and the use in another, it was enacted, anno 27 Hen. VIII. cap. 10. that the use and possession of lands should stand united, or that the possession should be given to him who had the use.

Hence this statute is called the Statute of Uses; or, in conveyances and pleadings, the statute *for transferring uses into possession*.

USE *and Custom*, in *Ancient Law-Books*, denotes the ordinary method of acting or proceeding in any case, which, by length of time, has obtained the force of a law.

USE, *Cestui que*. See CESTUI.

USE, *Contingent*. See CONTINGENT.

USE, *Resulting*, is an use which, being limited by the deed, expires, or cannot vest, and returns back to him who raised it, after such expiration, or during such impossibility: as if a man makes a feoffment to the use of his intended wife for life, with a remainder to the use of her first born son in tail; here, till he marries, the use results back to himself; after marriage, it is executed in the wife for life; and if she dies without issue, the whole results back to him in fee.

USE, *Secondary*, or *Shifting*, is that which, though executed, may change from one to another by circumstances *ex post facto*; as, if A makes a feoffment to the use of his intended wife and her eldest son for their lives, upon the marriage the wife takes the whole use in severalty; and upon the birth of a son, the use is executed jointly in them both. Blackst. Com. book ii.

USES, *Covenant to stand seised to*. See COVENANT.

USES *and Customs of the Sea* are certain maxims, rules, or usages, which make the base or ground-work of the maritime jurisprudence; by which the policy of navigation, and commerce of the sea, are regulated.

These uses and customs consist in three kinds of regulations. The first, called laws, or judgments of Oleron, were made by order of queen Eleanor, duchess of Guienne, at her return from the holy war; and that chiefly from memoirs which she had gathered in the Levant, where commerce was at that time in a very flourishing condition. She called them *rolls of Oleron*, because she then resided in an island of that name, in the bay of Aquitaine. These were much augmented, about the year 1266, by her son Richard, king of England, on his return from the Holy Land. See *Laws of* OLERON.

The second regulations were made by the merchants of Wisby, a city in the island of Gothland, in the Baltic, anciently much famed for commerce; most of the nations of Europe having their particular quarters, magazines, and shops, in it. These were compiled in the Teutonic language, and are still the rule in the northern countries. Their date does not appear; but it is probable they were made since the year 1288, when the city of Wisby was destroyed the first time, and afterwards restored by Magnus, king of Sweden. See *Marine* INSURANCE.

The third set of regulations was made at Lubec, about the year 1597, by the deputies of the HANSE-*Towns*.

USEDOM, in *Geography*, a town of Anterior Pomerania, situated on the south-west coast of the island of Usedom, on the bay of the Frische Haff; 8 miles E. of Anclam.—Also, an island in the Baltic, separated from the coast of Pomerania, partly by the river Peene, and partly by the Frische Haff; about 30 miles in length, of a very irregular form, and in no part above three miles from the sea. N. lat. 54° 15′ to 54° 45′. E. long. 13° 11′ to 13° 58′.

USEFF, a town of Tunis; 32 miles N.W. of Cairoan.

USEL, a river of Bavaria, which runs into the Danube, 3 miles W. of Neuburg.

USELETT, a long range of mountains in Tunis, called by the ancients *Mons Usalitanus*, W. of Cairoan.

USELLIS, in *Ancient Geography*, a town on the western side of the island of Sardinia, between the mouths of the rivers Thyrsus and Sacer, with the title of a colony.

USER DE ACTION, in *Law*, is the pursuing or bringing an action in the proper county, &c. See ACTION.

USETIN, or WZETIN, in *Geography*, a town of Moravia, in the circle of Hradisch; 30 miles N.E. of Hradisch.

USEU, a town of Spain, in Catalonia; 37 miles N. of Balaguer.

USEVASKOI, a town of Russia, in the government of Archangel, on the Mezen; 64 miles N.E. of Pineg.

USHA, in *Hindoo Mythology*, is a name of Reti, the wife of Kama, the god of love. She is fabled to have been incarnate in the person of a daughter of a raja named Bhima, to be espoused terrestrially by Kama, in an incarnation of his in the form of Anirudha, a son of Krishna. Kama is more commonly called Pradyamna in this avatara, or incarnation. The amours and adventures of Anirudha and Usha are the subject of a pretty tale, and a very interesting drama in several of the languages of the East.

USHANT, or OUESSANT, in *Geography*, a small island in the Pacific ocean, discovered in 1768 by M. Bougainville, near the coast of New Guinea. S. lat. 11° 5′. E. long. 146° 33′.

USHANT. See OUESSANT.

USHENICK POINT, a cape on the east coast of Lewis. N. lat. 57° 56′. W. long. 6° 25′.

USHER, HUISSIER, signifies an officer or servant who has the care and direction of the door of a court, hall, chamber, or the like.

In the king's houshold there are four gentlemen-ushers of the privy chamber, appointed to attend the door, to give entrance, &c. to persons that have admittance thither: four gentlemen-ushers, waiters, and an assistant gentleman-usher, and eight gentlemen-ushers, quarter-waiters in ordinary.

There are also in the queen's houshold three gentlemen-ushers of the private chamber, three gentlemen-ushers, daily waiters; each of whom has the same annual appointment with those of the king's houshold; and three gentlemen-ushers, quarterly waiters. In the French court, there are two ushers of the ante-chamber, or hall, where the king dines in public. They wait, sword by side, all the year, and open the door to such as are to come in. There are above sixteen ushers of the chamber, two of the cabinet, and one of the order of the Holy Ghost.

The ushers of the Inquisition in Spain and Portugal were persons of the first quality, who thought themselves highly honoured, by only looking to the doors of that sacred tribunal.

USHER is also used for an officer in the exchequer; of which sort, three or four attend the chief officers and barons at the court at Westminster, as also juries, sheriffs, and other accomptants, at the pleasure of the court. See EXCHEQUER.

USHER *of the Black-rod*. See BLACK-*rod*.

In a chapter held at Whitehall, 13 Car. II. it was ordained, that this office should be fixed to one of the gentlemen-ushers, daily waiters at court; the eldest of which always holds the place, and is called gentleman-usher, and black-rod.

In relation to the order of the Garter, he is appointed to carry the rod at the feast of St. George, and other solemnities, which he also makes use of as an authority to attach delinquents, who have offended against the statutes of the order, which he frequently doth by touching them with it. He wears a gold badge, embellished with the ensigns of the order. He has a house in Windsor-castle, and other privileges.

USHER, JAMES, in *Biography*, archbishop of Armagh, and primate of Ireland, was born at Dublin, January 4, 1580-1, being a descendant of an English family of the name of Neville, long settled in Ireland. He was taught to read by two maternal aunts, who had been blind from their infancy; and having been instructed in the elements of literature by two excellent scholars, who had removed from Scotland to Dublin, his proficiency was such, that in his 13th year he was fit for admission into the newly founded university of Dublin; and he was one of the three matriculated students on its opening in 1593. At this early period he is said to have been inclined to poetry; but at the age of 14, he was seriously engaged in historical studies. Such was his progress in this department of literature, that between his 15th and 16th years he had drawn up a chronicle of the Bible, as far as the book of Kings. Divinity was also an object that engaged his early attention, and the circumstances of the times led him to study the points in controversy between the Catholics and the Protestants; and he devoted no less than 18 years of the prime of his life to this kind of employment. He was diverted, however, from his academical career; yet in 1596 took his degree of B.A. It was the wish of his father that he would pursue the profession of law; but his views and purposes were of a different kind: and that he might not be embarrassed and obstructed by law-suits, to which his patrimonial property might be subject, he resigned his inheritance to his brother, reserving only for himself a sufficiency to maintain him at college, and to procure a supply of books. Of his proficiency in the Popish controversy, he gave an extraordinary proof when he was about 18 years of age; a challenge was published by a Jesuit to maintain in disputation the Catholic cause against the Protestants. Usher accepted the challenge, and had an interview with the Catholic champion. The dispute terminated by a discontinuance of the conference on the part of the Jesuit. In 1600 Usher took the degree of M.A., and was chosen proctor and catechetical lecturer of the university; and in his 21st year he was persuaded, though under the canonical age, to become a candidate for ordination, which was conferred upon him by his uncle, the archbishop of Armagh. The subject of his first sermon was the controversy between the Protestants and Catholics; and he took occasion, in the ardour of his zeal, to oppose the toleration, or indulgence, with regard to the exercise of their worship, which the Catholics were then endeavouring to obtain, because he considered their religion as superstitious and idolatrous, and the established government in church and state as endangered by it. The first ecclesiastical preferment conferred upon Usher was the chancellorship of St. Patrick's, Dublin, and this he held till he was promoted to the episcopal bench. In 1606 he revisited England, and contracted an intimate acquaintance with the two eminent antiquarians, Camden and sir Robert Cotton. To the former he communicated information relating to Ireland and Dublin, which was very serviceable to him in the composition of his "Britannia." In 1607 he took the degree of B.D., and was soon after made professor of divinity in the university of Dublin, which office he occupied during 13 years. About this time his attention was directed to a dispute concerning the Corban lands, anciently appropriated to the chorepiscopi, and free from secular imposts and jurisdiction, but liable to certain payments and services to the bishops. The substance of the treatise composed by him on this subject was translated into Latin, and afterwards published by sir Henry Spelman, in the first part of his Glossary. On his next visit to England, in 1609, he was noticed at court, and very much augmented his literary connections; and from this time he visited England regularly once

once every three years. When Usher had attained his 30th year, he was unanimously elected to the provostship of the college; but he thought proper to decline this honourable office. Two years afterwards he was admitted to the degree of D.D. In 1613, upon a visit to England, he printed at the royal press his first publication, entitled "Gravissimæ Quæstionis de Christianarum Ecclesiarum, in Occidentis præsertim Partibus, ab Apostolicis temporibus ad nostram usque ætatem, continua successione et statu, Historica Explicatio." This work may be regarded as a continuation of bishop Jewel's "Apology for the Church of England," intended to prove that the tenets of the Protestants were the same with those of the primitive Christians. In this year he married the daughter of Dr. Luke Chaloner, who charged his daughter, on his death-bed, to marry no one but Dr. Usher, if he ever proposed the connection. She was an heiress with a considerable fortune; and they lived together in the greatest harmony for 40 years, and left an only child, who was a daughter, and afterwards lady Syrrel.

At a convocation of the prelates and clergy of the Irish establishment, held at Dublin in the year 1615, it was determined that they should assert their independence on the church of England. Usher was principally employed on this occasion; and as he was known to maintain the opinion, that bishops were not a distinct order in the church, but only superior in degree to presbyters, he was represented to king James as a favourer of puritanism, which was the object of that monarch's invincible antipathy. When he visited England in 1619, he thought proper to bring with him a recommendatory letter from the lord-deputy and his council to the English privy-council, containing a testimonial to his orthodoxy, and a high encomium on his professional and moral character. This attestation, together with the satisfaction which he gave to the king of his orthodoxy religious and political, more especially with regard to the head of the church, and the unlawfulness of resistance to the royal authority, not only removed the prejudice which had been conceived against him in the royal mind, but obtained for him a spontaneous nomination to the see of Meath. On his return to Ireland in the following year, he was consecrated, and took possession of his see, with a resolution faithfully to perform the duties of his office. In a sermon preached before the lord-deputy in 1622, from the following text, "He beareth not the sword in vain," he gave offence to the Recusants, who considered it as a kind of call upon the new governor, lord Falkland, to employ the sword against the enemies of the established religion. Some exceptionable passages were pointed out to him by his metropolitan, primate Hampton, who advised a voluntary retractation. In this instance, the good prelate seems to have been urged by his zeal to overpass the limits both of discretion and equity. However this be, the persons then in power did not disapprove his sentiments; and the king was so pleased with the support he gave to his spiritual supremacy, that he soon after nominated him a privy counsellor of Ireland. In order to oppose the errors and superstitions of Popery, which were then prevalent, he published an English treatise concerning "the Religion of the ancient Irish and Britons:" the design of which was to evince the conformity of the doctrines and rites of the early ages of Christianity in these countries with those of the Protestants; and to point out the periods in which the practices of the church of Rome were introduced. This learned treatise was reprinted at London in 1631. He was afterwards engaged, by command of king James, in an elaborate work on the antiquities of the British church; and he came over to England, in order to obtain every kind of necessary information on his subject. On his return to Ireland in 1624, he employed some time in writing a reply to the challenge of an Irish Jesuit, in which work he displayed a very accurate acquaintance with ecclesiastical history and the writings of the fathers. Dr. Hampton having by his death left a vacancy in the see of Armagh and primacy of Ireland, Usher was nominated by the king to the vacant dignity, and received some other tokens of the king's predilection in his favour. The same attachment was manifested to our author by Charles I., who succeeded to the throne. In November 1625, our prelate was invited by the earl Mordaunt, afterwards the first earl of Peterborough, to visit him at his seat at Drayton, in Northamptonshire. The object of this visit was a disputation on the points in controversy between the churches of Rome and England. His lordship was a zealous Catholic, and his lady, the daughter and heiress of Howard lord Effingham, an equally zealous Protestant, who being desirous of converting her husband, had solicited Usher as her champion. The Catholic advocate was an English Jesuit. The conference between the disputants lasted three days, five hours in each day. The Catholic champion, upon a trivial pretence, withdrew from the contest, and lord Mordaunt became a convert. Upon his return to Ireland, after this adventure, in 1626, he was installed in his new dignity, and took his place at the head of the Irish church. As war subsisted at this time both with France and Spain, it was proposed to augment the military of Ireland; and to engage the concurrence of the Catholics, they were led to expect a more enlarged toleration of religion. The primate summoned a meeting of prelates, and they protested against the proposed indulgence; alleging, "that the religion of the Papists is superstitious and idolatrous; their faith and doctrine erroneous and heretical; and their church, in respect of both, apostatical. To give them, therefore, a toleration, or to consent that they may freely exercise their religion, and profess their faith and doctrine, is a grievous sin." Upon this protestation, Bayle observes, "that the archbishop and his suffragans acted according to the principles of the extremest intolerance; for they did not found their reasoning upon maxims of state, like the advocates for mitigated intolerance, but solely upon the nature of the Roman Catholic worship; without making any mention of its persecuting spirit, which is the only cause why even the friends of toleration argue that it ought not to be tolerated:" and this censure is unquestionably well grounded. Milton, though a friend to toleration in general, adds to his reasons for not tolerating Popery, that of its being idolatrous. But it is well observed by Dr. Aikin (ubi infra), that the argument against the toleration of Popery, on account of its being a false religion, is such as every established religion may with equal right urge against every other, and may therefore justify universal intolerance. See Toleration.

The primate, besides attending to the various duties of his office, employed himself and obtained the assistance of others in augmenting his library, and in promoting the common interests of literature. In order to procure oriental books and MSS., he corresponded with an intelligent merchant at Aleppo, and by his means obtained a curious copy of the Samaritan Pentateuch, a Syrian Pentateuch, and a Commentary on a great part of the Old and New Testaments, and several other valuable MSS. From the Samaritan Pentateuch he furnished some extracts for his friend Selden, in his "Arundelian Marbles;" and he deposited the MS. itself in the Cottonian library. Dr. Walton availed himself of Usher's collection in his Polyglott Bible; and

and his oriental treasures were finally centred, for the most part, in the Bodleian library. The primate, being with respect to doctrine Calvinistical, was alarmed by the progress of Arminianism in the English church at the commencement of king Charles's reign, and took part in the predestinarian controversy of that period. Accordingly he published, in 1631, a history of the Benedictine monk Gotteschalc, who, in the ninth century, strenuously vindicated the doctrine of predestination. This history, the first Latin production of the Irish press, is entitled "Gotteschalci et Prædestinariæ Controversiæ ab eo motæ Historia." Nevertheless he servilely submitted to royal instructions, communicated to him under the influence of Laud, a zealous partisan of Arminianism, for seizing all remaining copies of a work, published in Ireland by Dr. Downham, bishop of Derry, against the Arminians, avowing his purpose "that nothing should be hereafter published contrary to his majesty's sacred direction." In conformity to a circular letter from his majesty to the Irish archbishops, Usher was active in resisting the spread and prevalence of Popery. With this view he adopted a much better method than that of enforcing penal laws; which was that of cultivating an acquaintance with Catholics of different ranks, and treating them with hospitality and kindness.

In 1632 Usher appeared before the public as editor of an antiquarian work entitled "Veterum Epistolarum Hibernicarum Sylloge, quæ partim ab Hibernis, partim ad Hibernos, partim de Hibernis vel rebus Hibernicis sunt conscriptæ." Under the administration of lord-deputy Wentworth, who wished to render the government of Ireland in every respect dependent on the crown of England, the independency of the Irish church, which had articles and canons of its own, became a subject of litigation. When it was proposed in convocation, that the whole body of the English canons should be adopted by the Irish church, the primate at first resisted; but after much discussion, a compromise took place, by admitting a certain number of the English canons, and retaining such of the Irish as had a particular reference to the circumstances of that church and kingdom. It was afterwards stipulated that the candidates for ordination in the Irish church should subscribe both sets of articles, those of the English, and those of the Irish church; but this double subscription was found to be the cause of great confusion: and therefore, after the Restoration, the English articles alone were subscribed, as they have ever since been. In 1638 Usher published at Dublin a short treatise, entitled "Immanuel, or the Mystery of the Incarnation of the Son of God;" and in the following year, his great work "De Ecclesiarum Britannicarum Primordiis," of which an edition, corrected and improved by the author, was published at London in 1677. In the year 1640, the primate visited England; and in a parliamentary debate concerning church-government, he offered (says Whitelock) an expedient for conjunction, in point of discipline, that episcopal and presbyterial government might not be at a far distance, reducing episcopacy to the form of a synodical government in the ancient church. The parliament was speedily dissolved, and nothing resulted from this proposal. In 1641, a collection of tracts in defence of episcopacy was published at Oxford: and in this collection were two pieces of Usher's, *viz.* "A Discourse on the Origin of Bishops and Metropolitans," and "A Geographical and Historical Disquisition on the Lydian or Proconsular Asia;" which last was reprinted with additions at Oxford in 1643. By these tracts, it appears that Usher adhered to his early opinion, that bishops and presbyters differed not in *order*, but in *degree*, though he asserted the apostolical origin and authority of episcopacy. In defence of the cause of monarchy, he composed, by the king's command, a treatise concerning "The Power of the Prince, and Obedience of the Subject," which remained in MS. till after the Restoration, and was then published by the primate's grandson, James Tyrrel, esq., with a preface by bishop Sanderson.

On occasion of the impeachment of lord Strafford, Usher's conduct has been much censured. It was generally considered that the bishops were instrumental in persuading the king to consent to Strafford's death; and Usher not only shared in this imputation, but was charged with having taken this part in revenge for having been obliged by Strafford to concur in abrogating the articles of the Irish church. But the moral character of Usher raised him far above the suspicion of such malignity. Dr. Parr has produced the king's own attestation to the primate's innocence as to the charge of contributing to Strafford's fate. The Irish rebellion, which broke out in 1641, was very detrimental to the prelate in a variety of respects; so that for his support at the interval, he was obliged to sell his plate and jewels. His library, however, on which he set the principal value, in the midst of the wreck of all his other property, was preserved, having been conveyed to Chester, and thence to London. Soon after this disastrous event, he had a grant from the king of the temporalities of the see of Carlisle, then vacant, which supplied his moderate wants till the seizure of the episcopal lands by the Long parliament. It has been said by some, but doubted or denied by others, that in this time of his distress he was offered the place of honorary professor in the university of Leyden, with an increase of salary; and that cardinal Richelieu invited him to France, where he should enjoy an ample pension, and freedom of religion. After the commencement of the civil war, Usher resided at Oxford, where he pursued his literary studies, occasionally preached, and had frequent conferences with the king, who, it is said, assured him of his attachment to the Protestant religion. Such, at this time, was his attachment to the royal cause, that he declined being a member of the assembly of divines at Westminster in 1643, and controverted their authority; and this conduct gave great offence to the parliament, so that his library was confiscated; but by the interposition of Selden, it was redeemed by Dr. Featly, a member of the assembly, for a small sum, and afterwards returned to the original owner.

In 1644 Usher finished his corrected edition of the epistles of Ignatius, which was printed at Oxford, and entitled "Polycarpi et Ignatii Epistolæ; una cum vetere interpretatione Latina, ex trium Manuscriptorum codicum Collatione integritati suæ restituta, &c. &c."

He had also prepared for the press the Epistle of Barnabas, but the copy being destroyed by fire at the printer's, the author's "Premonition," concerning the age, author, and purpose of the epistle, which alone was preserved, was afterwards inserted, in a mutilated state, in bishop Fell's edition of the same epistle, Oxford, 1685. In 1645, the royal cause being on the decline, Usher obtained the king's leave to quit Oxford; and from thence he went to Cardiff, to his son-in-law, sir Timothy Tyrrel, who was then governor of the place. When Tyrrel was obliged to quit his command at Cardiff, Usher was under a necessity of seeking another refuge. Whilst he was in a state of suspense, he received an invitation from the dowager lady Stradling, to take up his abode at her residence in the castle of St. Donat's, Glamorganshire. On his way thither, in company with his daughter, he was met by a party of stragglers, who conducted him and his train to the main body of the army, who, though nominally raised for the king's service, considered

considered them as lawful objects of pillage, because they were English. They were rudely treated and plundered; but a party of officers interposed, and restored as much of the baggage as they could find. They then conducted the travellers to the house of sir John Aubrey, where they were lodged for the night. During his abode at St. Donat's, he was seized with a disorder which had nearly proved fatal, and which, indeed, occasioned a report of his death; but he afterwards slowly recovered, and continued in Wales nearly a year and a half. Failing to succeed in his attempt to cross the Channel, he accepted the invitation of the countess of Peterborough to reside at her house in London, and arrived thither in 1646. About this time there was an order of parliament to pay him the sum of 400*l. per annum;* but it does not appear that this pension was paid above once or twice. Early in the year 1647 he was elected preacher to the society of Lincoln's-Inn, and here he continued to enjoy comfortable apartments, and to officiate for nearly eight years. It is said that his sermons were chiefly extemporaneous, and no trace of them remains. His literary labours were continued. In the year 1648, when the king was confined at Carisbrook castle, in the Isle of Wight, Usher, and five others of the episcopal clergy, were deputed to visit him, and to treat with him on the subject of church-government. The primate renewed his former proposition of "Episcopal and Presbyterial Government conjoined:" but the parliamentary commissioners being determined upon the total abolition of episcopacy, the treaty terminated without effect. In a conversation which occurred between Baxter and Usher, it appears that the latter admitted the validity of presbyterian ordination. "I asked him," says Baxter, "his judgment about the validity of presbyters' ordination, which he asserted, and told me, that the king asked him at the Isle of Wight, where ever he found in antiquity that presbyters alone ordained any? and that he answered, I can shew your majesty more, even where presbyters alone successively ordained bishops; and instanced in Hierom's words (Epist. ad Evagrium) of the presbyters of Alexandria choosing and making their own bishops from the days of Mark till Heraclius and Dionysius." After this interview with the king, Usher saw him only once more, on the scaffold. The sight was so affecting, that he was obliged to withdraw; and being overpowered by it, he was led down from the leads of lady Peterborough's house, at Charing-cross, and laid upon his bed, where abundant tears and prayers gave relief to the deep sorrow with which he was overwhelmed. His great chronological work, entitled "Annales Veteris Testamenti," was so far completed, that in 1650 he published the first part of it, and the second part was printed in 1654. In 1652 he published his "Epistola ad Lodovicum Capellum de Textus Hebraici variantibus lectionibus," in which he displays varied and profound erudition concerning the Greek Septuagint and the Samaritan Pentateuch. It appears that Cromwell requested a conference with Usher, and that the former promised the primate a lease for twenty-one years of part of the lands belonging to the archbishopric of Armagh, which he did not refuse to accept; but the grant was never passed during his life, and after his death was refused to his daughter and son-in-law on the pretext of "malignancy." On occasion of the death of his old friend Selden, towards the close of the year 1654, he delivered a funeral discourse at the Temple-church before a splendid and numerous audience; and this was the last of his public pulpit services. His work "De Græca Septuaginta Interpretum Versione Syntagma, &c." was printed in 1655. In an interview with the Protector, whilst he was attended by a surgeon who dressed a boil on his breast, Cromwell said, "If this core (pointing to the boil) were once out, I should quickly be well." "I fear," replied Usher, "the core lies deeper; there is a core at the heart that must be taken out, or else it will not be well." "Ah!" rejoined the unhappy great man, "so there is indeed!" pronouncing the words with a sigh. At Ryegate, whither the primate soon after retired, he employed himself in the completion of his "Chronologia Sacra;" and here he felt symptoms of decay; for in his almanac, opposite to his birth-day, in 1655-6, was found written the following note: "Now aged seventy-five years: *my days are full:*" and after a small interval, in capital letters, the word RESIGNATION. On the 20th of March he was attacked with a pleuritic inflammation, which occasioned acute pain, and indicated his approaching end. Having taken respectful and grateful leave of his noble hostess, the countess of Peterborough, he withdrew, and requested to be left to his private devotions. The last words he was heard to utter were, "O Lord, forgive me; especially my sins of omission!" and presently after expired, March 21, 1655-6, having completed his 75th year nearly three months. It was proposed to bury him at Ryegate, in lady Peterborough's family vault; but Cromwell sent an order that his body should be brought for burial in Westminster-abbey, with the ceremony of a public funeral. On the 17th of April his remains were met, near London, by the carriages of most persons of rank then in town; and from Somerset-house to the Abbey they were attended in procession by all the clergy, and a great concourse of people. The funeral sermon was preached by Dr. Nicholas Bernard, the primate's former chaplain, upon the following appropriate text: "And Samuel died, and all Israel were gathered together, and lamented him, and buried him."

Primate Usher was in person moderately tall and well-shaped, with an erect carriage to the last; of a sanguine complexion, and features expressing gravity and benevolence combined. His constitution was firm, and enabled him to bear uninjured his early hours of study, and the various fatigues of a life both active and contemplative. His mode of living was simple; his manners were free and affable, void of all pomp and affectation; his temper was remarkably sweet and placable, though he could rebuke with severity when he thought the occasion required it. Among his numerous eulogists, no one, perhaps, has estimated him more correctly than bishop Burnet, who, in his "Life of Bishop Bedell," mentions the primate in the following terms:

"Together with his great and vast learning, no man had a better soul, and a more apostolic mind. In his conversation he expressed the true simplicity of a christian; for passion, pride, self-will, or the love of the world, seemed not to be so much as in his nature; so that he had all the innocence of the dove in him. He had a way of gaining people's hearts, and of touching their consciences, that looked like somewhat of the apostolic age revived. He spent much of his time in those two best exercises, secret prayer, and dealing with other people's consciences, either in his sermons or private discourses; and what remained he dedicated to his studies, in which those many volumes that came from him shewed a most amazing diligence and exactness, joined with great judgment; so that he was certainly one of the greatest and best men that the age, or perhaps the world, has produced. But no man is entirely perfect: he was not made for the governing part of his function. He had too gentle a soul to manage that rough work of reforming abuses, and therefore left things as he found them."

Usher, through life, seemed to have had gloomy forebodings with regard to the return and temporary triumph of popery,

popery, and he founded his predictions of such an event on his interpretation of some passages of Scripture; and it has been said, that at some seasons he seemed to think himself warranted to speak of future events in a higher tone of authority than as a mere conjecturer. A popular opinion prevailed, that Usher was endowed with a prophetic spirit; but there is no sufficient evidence that he himself pretended to this extraordinary gift. It was his intention to have left his library, consisting of nearly 10,000 books and MSS. to his "alma mater" at Dublin; but being stripped, by the disasters of the times, of all other property, he thought it right to bequeath it to his daughter, to whom he had given nothing, and who had a large family. The king of Denmark and cardinal Mazarin bid for it; but the Protector conceiving it disgraceful to his administration to allow such a treasure to be sent out of the kingdom, prohibited the disposal of it without his consent. Probably through his private suggestion, the officers and soldiers of the victorious army in Ireland purchased it for 2200*l*., with a view of appropriating it agreeably to the first intention of the primate. It lay at the castle till the Restoration, and after suffering various depredations, it was bestowed by Charles II. upon Dublin college.

It has been a subject of dispute, how far the opinions of Usher differed from those of the established church. Dr. Peter Heylin alleged against him many charges of non-conformity. These are summed up under distinct heads, and particularly examined by Dr. Parr. Our limits will merely allow a recital of them. 1. The divine authority for keeping the sabbath, or seventh day's rest, as transferred to the Christian Sunday. 2. His opinion that bishops and presbyters differ in degree only, not in order; and, as an inference, that presbyterian ordination and sacraments are valid. 3. His limitation to the elect of that universal redemption of mankind by the sufferings and death of Christ, which is the doctrine of the church of England. It is, however, a subject of controversy not yet decided, whether the articles of the English church, as to these points, are to be understood in a Calvinistic or an Arminian sense. In early life, the theological system of Usher was Calvinistic; but it has been said that he changed his sentiments concerning the doctrines of Calvinism before his death. 4. The primate is accused by Heylin of not holding the doctrine of the *true and real presence* of Christ's body and blood in the sacrament of the eucharist, conformably to the church of England. But it is hardly conceivable that any modern divine of the church of England would go farther than the primate, who distinguished between the outward and inward act of the communicant: "in the first of which he really receives the visible elements of bread and wine; in the second, by faith, really receives the body and blood of our Lord, that is, is truly and indeed made partaker of Christ crucified to the spiritual strengthening of the inward man." 5. The next charge is, that he did not admit the power of the priest to forgive sins, in the sense of the church of England. Heylin contends for an *authoritative* power in the priest to remit sins; whereas the primate's opinion seems to have been, that the priest's absolution is only *declarative*, or on condition of repentance; or *optative*, by the way of prayers and intercession. Dr. Parr contends, that the doctrine of the church is that held by the primate. 6. His opinion concerning Christ's descent into hell is alleged to have deviated from that of the church, inasmuch as he did not admit of a local descent into the real hell, or place of punishment for the wicked, but a mere separation between the soul and body during the time that Christ lay in the grave.

As a man of learning, Usher's name became celebrated throughout Europe, and he carried on a correspondence with several learned persons, both at home and abroad. Of his works we shall here subjoin a catalogue.

Publications of archbishop Usher:—De Ecclesiarum Christianarum Successione et Statu, 1613; The Religion of the ancient Irish and Britons, 1622; Gotteschalci et Prædestinariæ Controversiæ ab eo Motæ Historia, 1631; Veterum Epistolarum Hibernicarum Sylloge, 1632; Immanuel, or the Mystery of the Incarnation of the Son of God, 1638; De Ecclesiarum Britannicarum Primordiis, 1639; A Discourse on the Origin of Bishops and Metropolitans, 1641; A Geographical and Historical Disquisition on the Lydian or Proconsular Asia, 1641; Polycarpi et Ignatii Epistolæ, &c. 1644; Appendix Ignatiana, 1647; Diatriba de Romanæ Ecclesiæ Symbolo Apostolico aliisque Fidei Formulis, 1647; De Macedonum et Asianorum Anno Solari, 1648; Annalium Pars prior, 1650; Epistola ad Ludov. Capellum de Textus Hebraici variantibus Lectionibus, 1652; Annalium Pars posterior, 1654; De Græca Septuaginta Interpretum Versione Syntagma, 1655.—Posthumous: Various Tracts, edited by Dr. Bernard, 1657; Chronologia Sacra, edited by Dr. Barlow, 1660; The Power of the Prince, and Obedience of the Subject, written 1641, printed after the Restoration; Historia Dogmatica Controversiæ inter Orthodoxos et Pontificios de Scripturis et Sacris Vernaculis: Accessere Dissertationes duæ, 1690.

See the life of Usher by Dr. Aikin, who appeals for the facts which he has recited to the Life of Usher by Dr. Parr, who was the primate's chaplain at the time of his death; and who has annexed to his account a large collection of letters, that passed between Usher and his correspondents; and also to the Life of Usher by Dr. Smith, which is the first and principal article of his work, entitled "Vitæ quorundam eruditissimorum et illustrium Virorum," 1707, 4to.

USIA, in *Geography*, a river of Russia, which runs into the Vaga; 8 miles S. of Vielsk, in the government of Vologda.

USIATIN, a town of Poland; 28 miles N. of Kaminiec.

USIDICANI, in *Ancient Geography*, a people of Italy, in Umbria.

USIDITANA, a town of Mœsia, in the vicinity of Thamyris.

USIJES, in *Geography*, a town of Arabia, in the province of Yemen; 12 miles N.N.W. of Chamir.

USILLA, Ins-kills, in *Ancient Geography*, a place of Africa, upon the coast of the Mediterranean sea, S. of Ruspa.

USIMADO, in *Geography*, a town of Japan, in the island of Niphon; 86 miles S.W. of Meaco.

USINGEN, a town of Nassau Usingen, which gives title to a branch of the house of Nassau, with a family seat. In 1793, it was taken by the French; 12 miles S.S.E. of Weilburg.

USIPII, or Usipians, in *Ancient Geography*, a people of Germany, who at occasional intervals of time, inhabited the same places with the Teuchteri. The Usipii anciently dwelt between the Cherusci and the Sicambri; but the Catti expelled them; and after having wandered for about three years in different countries of Germany, they established themselves upon the Rhine, in the vicinity of the Sicambri. The Menapii occupied the two banks of this river; and therefore it must have been with their consent that the Usipians and Teuchteri took possession of the country of the Menapians, situated to the E. of the Rhine. In the year 698 of Rome, the Usipians and Teuchteri were almost entirely

entirely exterminated. A very small remnant of a populous nation repassed the Rhine, and established themselves with the Sicambri: but in the time of Augustus, or a little more than half a century after the terrible defeat just mentioned, they found themselves in a condition to make war, first with the Sicambri, and then with the Romans. From the expedition of Drusus into Germany, we learn that the country of the Usipians and that of the Teuchteri were then different. The Usipians extended along the right bank of the Lippe; but when Drusus passed the Rhine, and subjugated the Usipians, he threw a bridge over the Lippe, by which he entered into the country of the Sicambri. The Teuchteri inhabited a territory W. of the Sicambri, and the Rhine separated them from the Menapians. Tiberius, having afterwards transported the Sicambri into Gaul, the country which they had occupied in Germany was given to the Usipians and Teuchteri; at length the Teuchteri extended themselves along the Rhine from the Segos (the Sige) as far as the Roer, and along the Lippe and the Alise (the Alene). As to the Usipians, they remained on the two banks of the Lippe and the Rhine, perhaps as far as the place where the Rhine divides to form the isle of the Batavi. At the commencement of the reign of Trajan, it appears that the Teuchteri had been almost exterminated by the Cherusci and Angrivarians, who took possession of a great part of their territory. The Usipians must also have suffered. In the time of Constantine, the Usipians and the Teuchteri ceased in a manner to have any political existence, having probably submitted to some people more powerful than themselves.

USITZA, in *Geography*, a town of Servia, taken by the Turks in 1738; 23 miles N.W. of Jenibasar.

USK, a borough and market-town in the upper division of the hundred of the same name, and county of Monmouth, England, is situated at the confluence of the rivers Olwy and Usk, at the distance of 14 miles S.W. from the county-town, and 144 miles W. by N. from London. Though scarcely a vestige of Roman remains has, at least in modern times, been discovered at this place, all antiquaries, except Salmon, who makes this the site of Isca Silurum, have agreed to fix here the Burrium of Antoninus' Itinerary, and the Bullæum of Ptolemy. It is evident that Usk is a place of high antiquity, and has been of much larger extent and greater importance. The history of its castle furnishes the earliest written records of the place; and though from some of its architectural features, it appears to have been of Roman or Roman-British origin; yet the remotest notice that has hitherto been discovered is, that, in the time of Henry III., it formed part of the possessions of Richard de Clare, earl of Gloucester: from his family it came to the Mortimers, earls of March. In the third year of Henry VI., on the death of Edmund Mortimer without issue, his great possessions were granted to his nephew Richard duke of York, whose favourite residence this castle appears to have been: his sons, Edward IV. and Richard III., were born here. On the death of the latter, it became the property of Henry VII.: it afterwards belonged to William Herbert, first earl of Pembroke: the duke of Beaufort is the present proprietor. This fortress experienced frequent assaults during the alternate successes of the Welsh chieftains and the Anglo-Norman lords: and it suffered particularly, together with the town, in the ravages of Owen Glendwr, who, at length, here met with a compleat defeat. The present remains of the castle consist of a court, the principal entrance to which is by a tower gateway, having a pointed arch with a groove for a portcullis: an area of considerable extent is surrounded by walls, flanked with round and square towers, destitute of windows, but having occasional narrow apertures: within are the keep, a square tower, and several apartments, one of which appears to have been the baronial hall. A priory was founded in this town, previous to the year 1236: a few remains of the building are still standing; and in an apartment on the first floor, the frieze of the ceiling is decorated with thirty emblematic devices and emblazoned arms. Usk is a borough town and since the 27th year of Henry VIII. has been privileged with elective franchise, being, in conjunction with Monmouth and Newport, represented by one member of parliament. By a charter granted in 1398, the civil government is vested in a bailiff, community, and burgesses. The town is of considerable extent, but, according to the population return of the year 1811, contains only 164 houses, and 844 inhabitants. Several ways bear the name of streets, though scarcely deserving that appellation: for the houses in general are isolated, having gardens, orchards, and paddocks intervening; which, though they give an irregularity to the town, tend much to comfort and convenience. Two fairs are held annually, and a small market weekly on Mondays: the town has no trade, and only a small manufactory of japan ware. Some of the inhabitants derive advantage from its being a thoroughfare; some are employed in husbandry; and some gain a maintenance by the salmon fishery, which is abundant in the river Usk. The church, which belonged to the priory, appears to have been erected in the Anglo-Norman era. By foundations yet remaining, it was built cruciform, in the manner of a cathedral: the square embattled tower, now standing at the east end, was in the centre, and seems to have communicated with a transept and choir, both of which have long been destroyed. Many alterations have taken place in the building; the circular columns and arches of the tower exhibit the Norman character; but the nave is separated from the north aile by four pointed arches, and the windows and doorways are in the same style. The interior affords nothing worthy of notice, except an inscription on a brass plate, which has for more than half a century been a perplexing subject to antiquaries, and still appears to defy critical disquisition. It was first published in the second volume of the Archæologia, thence copied into Gough's edition of Camden, and since given more correct by Mr. Coxe. A stone bridge of five circular arches, flanked on each side by triangular buttresses, is the only other public structure deserving mention. Near the foot of the bridge was formerly a Roman Catholic chapel: it is now the common prison. In the vicinity of Usk are several ancient encampments: almost every two or three miles exhibit vestiges of hostile positions, and the tumuli of heroes slain.—Beauties of England and Wales, vol. xi. Monmouthshire, by J. Britton, F.S.A. Coxe's Historical Tour through Monmouthshire, two vols. 4to. 1801.

USK, a river of South Wales, which rises in the S.W. part of the county of Brecknock, and runs into the Severn, below Newport, in Monmouthshire.

USKALINMAA, a small island on the E. side of the gulf of Bothnia. N. lat. 61° 18′. E. long. 21° 5′.

USKEI, an island belonging to Russia, in Beering's straits. N. lat. 65° 58′. E. long. 189° 21′.

USKELA, a town of Sweden, in the government of Abo; 27 miles E. of Abo.

USKER, a town of Asiatic Turkey, in the government of Kur, on the Kur; 12 miles N.N.E. of Akalzikè.

USKOLOMSKOI, a town of Russia, in the province of Ustiug, on the Vitchegda; 80 miles E.N.E. of East Sisolsk.

USKUBS, a town of Natolia; 36 miles N.W. of Boli.

USLAH, a town of Bengal; 9 miles S. of Curruckdeah.

USLAR, a town of Weftphalia, in the principality of Calenberg. In the year 1575, duke Frederic ordered the name to be changed to Freudenthal; 17 miles W.N.W of Gottingen.

USMAN, a town of Ruffia, in the government of Tambov, on a river of the fame name; 40 miles S.W. of Tambov. N. lat. 52° 8'. E. long. 40° 24'.

USNAU, *Ifland of*, fometimes called *Hutten's Ifland*, a fmall ifland in the lake of Zuric, Switzerland, about an Englifh mile in circumference, belonging to the abbey of Einfedlin. It contains only a fingle houfe, two barns, a kind of tower or fummer-houfe, a chapel that is never ufed, and a church in which mafs is faid once a year. Within is the tomb of St. Alderic, who built an hermitage in the ifland and retired hither, where he died, after a life of reputed fanctity, in 1473. It is called Hutten's ifland, from an extraordinary perfon of that name, famed for his learning and valour, and for his intemperate ardour in defence of the opinions of Luther. After having rendered himfelf an object of terror both to Lutherans and Catholics, he fought repofe in this fequeftered ifland, and died here in 1523, in the 36th year of his age. The ifland, which is agreeably diverfified with hill and dale, is very fertile in pafture, produces hemp, flax, a few vines, and a fmall tufted wood, which overhangs the margin of the water. This is the only ifland in the lake, except an uninhabited rock, which yields a fmall quantity of hay.

USNEA, in *Botany*, a name retained by Dillenius, for which he modeftly folicits the indulgence of botanifts, notwithftanding its Arabian origin, being derived from the *Axneeb* and *Ufnee* of Serapio. It has long been the officinal name of one of this genus, which, though funk in *Lichen* by Linnæus, is now reftored by Acharius, under the above appellation.—Dill. Mufc. 56. Achar. Prodr. 223. Meth. 306. Lichenogr. 127. t. 14. f. 5. Syn. 303. Sm. Prodr. Fl. Græc. Sibth. v. 2. 322. Hoffm. Germ. v. 2. 132.—Clafs and order, *Cryptogamia Algæ*. Nat. Ord. *Algæ, Lichenes*.

Eff. Ch. Receptacles? orbicular, peltate, fcarcely coloured, without a border; fubtended by a dilatation of the frond, which is branched, and contains a central elaftic pith.

The filamentous Lichens of Linnæus chiefly compofe this genus. (See LICHEN, fect. 9; and LICHENES, n. 6, n. 28, and n. 21.)—We need not repeat the account and obfervations there given, refpecting the fructification of the genus before us. With refpect to its technical difcrimination, Acharius confiders as effential the very tough, elaftic, central thread, which pervades the whole *frond* and its branches, remaining unbroken when the outer coat, tumid and cracked, affumes, in feveral fpecies, a jointed or beaded appearance. The orbicular difks are not circumfcribed by any tumid border from the frond, but are often bounded by an indeterminate, or irregular, dilatation of that part, very frequently fubtended, or fringed, with prominent briftles, or threads, refembling young branches. How far thefe difks are real receptacles of *feeds* muft appear, from the obfervations above cited, very doubtful; or rather it feems clear that they are not fo, and that the convex more coloured *tubercles*, deftitute of any border, found in fome of the fpecies, are more probably the *receptacles*. According to this idea, we fhould rather prefer the following:

Eff. Ch. Receptacles lateral, feffile, tumid, rugged, coloured, without a border. Frond thread-fhaped, branched, with a central elaftic pith.

Leaving the queftion thus open, for future examination and determination, we proceed to the elucidation of the fpecies, which are very prudently curtailed in the laft work of Dr. Acharius, his *Synopfis*.

1. U. *melaxantha*. Orange and black Ufnea. Ach. Syn. n. 1. Meth. 307. (Lichen aurantiaco-ater; Jacq. Mifc. v. 2. 369. t. 11. f. 2. Linn. Syft. Veg. ed. 14. 965.)—Frond nearly erect, tufted, rough, tawny: ultimate branches tapering, black. Difks concave; black above; corrugated underneath; naked at the margin.—Commerfon, Menzies, and other voyagers, have gathered this handfome fpecies, at the ftraits of Magellan, Staten land, Falkland iflands, &c. The *ftem* is fimple at the root, but divides immediately into a denfe bufhy mafs of fubdivided, entangled, round, very tough *branches*, and is three or four inches high. The furface is rough with minute points, partly tawny or orange-coloured, partly black and fhining; the fmaller branches are beautifully annulated with tawny and black alternately; the ultimate ones black, tapering to a fharp point. The internal fubftance is folid, white, very hard. *Receptacles* lateral, folitary, caufing the branch to form an acute angle at the infertion of each. When young they are almoft globular, then hemifpherical, or nearly flat. Their difk is dark brown or black, and of a diftinct fubftance from the pale or tawny acceffory border, formed from the frond, inflexed when young, corrugated beneath, remaining thin, even, fmooth, naked and uninterrupted, encompaffing the difk.

We admit this fpecies here chiefly in conformity to our diftinguifhed guide. While we beg leave to proteft againft his change of the excellent original name, we decline reftoring that name combined with *Ufnea*, becaufe we feel fome fufpicion that the plant may belong to Dr. Acharius's new genus *Evernia*, Syn. 244. The *frond*, though corticated, is folid, and the *receptacles* are fhield-like, feffile, with a thin coloured concave *difk*, furrounded by an elevated inflexed margin from the fubftance of the frond, which are the characters of *Evernia*, rather than of *Ufnea*.

2. U. *jamaicenfis*. Jamaica Ufnea. Ach. Syn. n. 2. "Lichenogr. 619. Nov. Act. Upfal. with a figure, unpublifhed."—"Frond nearly erect, rough, pale, forked: branches divaricated, widely fpreading. Difks peltate, nearly feffile, rather concave, of the colour of the frond; fmooth, appendiculated and proliferous beneath; naked in the circumference."—Native of trees in the Weft Indies. *Acharius*.

3. U. *cornicularia*. Brown-horned Ufnea. Ach. Syn. n. 3. "Lichenogr. 619. Nov. Act. Upfal. with a figure, unpublifhed."—"Frond fpreading, rigid, very fmooth, thread-fhaped, flender, white, much branched: branches intricate, zigzag: ultimate ones partly brownifh."—Found on the trunks of trees in New Zeeland. *Acharius*.

4. U. *ceratina*. Intricate-horned Ufnea. Ach. Syn. n. 4. "Lichenogr. 619. Nov. Act. Upfal. with a figure, unpublifhed."—"Frond proftrate, rather pendulous, rigid, very rough, whitifh, flightly fibrous: branches very long, fubdivided, fpreading, diffufe. Difks concave, of the colour of the frond; fomewhat proliferous beneath; encompaffed with long, ftout, curved rays."—Found on trees in Silefia. The author mentions a variety, found on rocks in France, Spain, and North America, thus diftinguifhed.

b. *fcabrofa*. "Frond erect, rough, rigid, fomewhat tufted, pale, branched: branches ftraight or zigzag, tapering, widely fpreading."

Some fpecimens from America are furnifhed with red tubercles, or *cephalodia*.

5. U. *florida*. Flowery Ufnea. Ach. Syn. n. 5. Meth. 307. Sm. Prodr. Fl. Græc. n. 2482. Hoffm. Pl. Lich. v. 2.

v. 2. 19. t. 30. f. 2. (U. vulgatiſſima tenuior et brevior, cum orbiculis; Dill. Muſc. 69. t. 13. f. 13. Lichen floridus; Linn. Sp. Pl. 1624. Ehrh. Crypt. n. 148. Engl. Bot. t. 872.)—Frond nearly erect, rough, greyiſh, with crowded horizontal fibres; branches widely ſpreading, ſcarcely divided. Diſks flat, very broad, whitiſh, with long rays. Tubercles fleſh-coloured, nearly globular, wrinkled. —Frequent on old trees, eſpecially about the tops of aged oaks, ſometimes on pales, in various parts of Europe. The *fronds* form upright, buſhy tufts, of a pale greeniſh-grey when moiſt, whiter when dry, ſpringing from a hard black baſe; they are round, conſiſting of a cruſtaceous bark, encloſing a tough white fibre, the bark ſlightly cracking here and there, but not widely. The innumerable *branches*, crowded with taper fibres, are poliſhed, though minutely warty. When of full age, they bear very broad, unequal, irregular diſks, at firſt lateral, but by the flexure of the branch, and the ſtoppage of its growth, becoming terminal. They are ſmooth on both ſides, paler or ſlightly fleſh-coloured on the upper, having all the appearance of the ſhield of a *Parmelia*, &c.; their border of the ſubſtance of the frond, narrow, elevated when young, copiouſly fringed with radiating fibres. The ſame plant bears, though rarely, ſmall fleſh-coloured *tubercles*, ſituated like the diſks, deſtitute of rays; having when young a tumid even border, of their own ſubſtance and red colour, which is ſubſequently obliterated, as in the genus *Lecidea*, by the great elevation and ſwelling of the middle part, forming a tubercle like thoſe of a Cup-Lichen, *Bæomyces*. Theſe were noticed by Hoffmann, Perſoon, and Schrader, though that circumſtance was unknown to us, before they appeared in *Engliſh Botany;* and the diſcovery is the moſt curious that has for a long while been made in the hiſtory of the *Lichen* tribe.

Acharius enumerates the following varieties.

b, *rigida*. "Frond elongated, ſtraight, rigid, ſlender, ſomewhat dependent, rough; branches rather long, zigzag, beſet with fibres and ſmall branches."—Native of Luſatia and England.—We have not met with any thing anſwering to this.

c, *ſtrigoſa*. Ach. Meth. 310. t. 6. f. 3.—Frond ſpreading, branched, dirty grey, rough: branches elongated, zigzag, forked, lax, cloſely beſet all over with prominent parallel fibres. Diſks fleſh-coloured, very broad, ſomewhat lobed, with radiating teeth.—Found in North America. This ſeems merely the effect of age.

d, *villoſa*. "Frond and branches dirty aſh-coloured, diffuſe and entangled, clothed with very ſhort and crowded villous fibres."

e, *rubiginea*. Michaux Boreal.-Amer. v. 2. 332.—"Frond ſomewhat fibrous, of a ruſty red, with diſks of the ſame colour."—Native of North America.

f, We have a very long, ſtraggling, minutely fibrous, variety, brought by Mr. Menzies from the Cape of Good Hope, which hardly comes under any of the above definitions. On this we have ſeen one ſolitary fleſh-coloured *tubercle*, ſituated on the main *ſtem*, as in *U. hirta*.

6. U. *hirta*. Common Rough Uſnea. Hoffm. Pl. Lich. v. 2. 17. t. 30. f. 1. Sm. Prodr. Fl. Græc. n. 2483. (U. florida β; Ach. Meth. 309. U. plicata c; Ach. Syn. 305. n. 6. U. vulgatiſſima tenuior et brevior, ſine orbiculis; Dill. Muſc. 67. t. 13. f. 12. Lichen hirtus; Linn. Sp. Pl. 1623. Ehrh. Crypt. n. 138. L. floridus β; Hudſ. 560. Ach. Prodr. 224.)—Frond erect, ſomewhat ſhrubby, much branched, greeniſh-grey: branches ſpreading, wavy, fibrous, roughiſh, entangled, tapering. Tubercles lateral, ſlightly elevated, fleſh-coloured, rugged. Radiating diſks none.—Extremely common on trees, poſts, and pales, throughout Europe, as well as in America. We cannot conceive this to be a variety, either of the preceding or the following ſpecies. The whole plant is more finely fibrous than *U. florida*, and rather greener. The *tubercles* are lateral, and do not diſturb the direct continuation of the branch beyond them; nor are they ſo perfectly ſeſſile, but rather elevated on a ſhort thick ſtalk. Sometimes we find them accompanied by a few radiating fibres, but never approaching to the nature of an expanded diſk.

To this we preſume muſt belong the variety d, *glabrata*, of Ach. Syn. 306. n. 6.—"Frond nearly upright, rather ſhrubby, white, very ſmooth and naked: branches crowded, widely ſpreading, nearly ſimple, fibrous; powdery at the ſummit."—Native of Switzerland. Wool boiled in water with *U. hirta*, without alum, takes a fine permanent tawny yellow.

7. U. *plicata*. Stringy Uſnea. Ach. Syn. n. 6. Meth. 310. (U. vulgaris, loris longis implexis; Dill. Muſc. 56. t. 11. f. 1. Lichen plicatus; Linn. Sp. Pl. 1622. Engl. Bot. t. 257. Weſtring Lich. t. 8.)—Frond pendulous, ſmoothiſh, pale grey: branches lax, compound, entangled, partly fibrous; the ultimate ones capillary. Diſks flat, fringed with ſlender fibres.—Found hanging from the branches of old trees, in dark ſhady woods of the more mountainous countries of Europe. The whole plant, when full grown, meaſures from one to two feet in length, being a denſe maſs of entangled branching fibres. Its hue is leſs green than that of *U. hirta*, nor have any fleſh-coloured *tubercles* been remarked on this ſpecies. The *diſks* at firſt reſemble ſuch tubercles in form, but not in colour; ſoon becoming concave, with an inflexed ſomewhat radiated margin; and at length expanding into a flat ſhape, ſmooth and even on both ſides, very ſlightly tinged with red-brown above, their border more or leſs fringed with radiating, ſometimes elongated, fibres. To this is now reduced, as a variety,

b, *comoſa*. (Lichen comoſus; Ach. in Stockh. Tranſ. v. 16. 209. t. 8. f. 1.)—"Frond rather erect and ſhrubby, pale and whitiſh: lateral branches widely ſpreading, diffuſe, crowded, ſmooth, much divided; the ultimate ones taper-pointed, roughiſh, ſlightly drooping. Tubercles pale-fleſh-coloured, finally brown."—Found chiefly on tall ſtems of Birch-trees, in Sweden. We have not examined this plant, but its tubercles ſeem to agree rather with *U. hirta*, as well as its habit.

8. U. *barbata*. Bearded Uſnea. Ach. Syn. n. 7. Meth. 313. Sm. Prodr. Fl. Græc. n. 2484. (U. barbata, loris tenuibus fibroſis; Dill. Muſc. 63. t. 12. f. 6. Lichen barbatus; Linn. Sp. Pl. 1622. Engl. Bot. t. 258. f. 2.)

b, *daſopoga;* Ach. Syn. 306. n. 7. (U. plicata γ, daſopoga; Ach. Meth. 312. "U. barbata; Hoffm. Germ. v. 2. 132, excluding the reference to Dillenius." *Achar.*)

c, *articulata;* Ach. Syn. ibid. (U. barbata β; Ach. Meth. 313. U. capillacea et nodoſa; Dill. Muſc. 60. t. 11. f. 4. Lichen articulatus; Linn. Sp. Pl. 1623. Engl. Bot. t. 258. f. 1.)

d, *inteſtiniformis;* Ach. Syn. ibid.

Frond pendulous, ſmooth, tumid, cracked, inflated, greyiſh-white: branches divaricated, fibrous, with capillary points. Tubercles lateral, fleſh-coloured, ſomewhat lobed. —Found on the branches of old trees in various parts of Europe, ſcarcely bearing tubercles but in Italy, and other ſouthern countries. The variety d we have from Exmouth warren, Devonſhire, where it grows on the ſandy ground, in large patches. This elegant and ſtriking ſpecies has always more or leſs of a jointed, or bearded, appearance, the principal

cipal *stems* resembling a necklace: in the last variety, d, they are singularly inflated and pitted, though less interrupted or broken, while the subdivided branches are more suddenly capillary than the usual habit of the plant. That the *Lichen barbatus* and *articulatus* of Linnæus constitute but one species, and are hardly varieties of each other, Mr. Lightfoot first hinted, nor could any one have a doubt on the subject after examining the Dillenian specimens. What the variety, b, *dasopoga*, of Acharius may be, we have no authentic information. It has been referred to *plicata*, but if at all like that species, it can have no affinity to the present. *U. barbata* never exhibits, as far as we can learn, any traces of radiated disks. Its proper fructifications are the lateral, flesh-coloured, much wrinkled or lobed, *tubercles*, ranged numerously along some of the branches, without causing any flexure, or change in their direction. These we have gathered near Viterbo. (See Tour on the Continent, ed. 2. v. 1. 335.) They are represented in Engl. Bot. t. 258, and in Micheli, Nov. Gen. 76. t. 39. f. 1, 2. The central pith in this species is very slender, appearing between the disunited portions, like a rough thread of very white cotton.

9. U. *longissima*. Long Slender Usnea. Ach. Syn. n. 8. Nov. Act. Upsal. with a figure, unpublished.—"Frond pendulous, thread-shaped, slightly compressed, rough and somewhat powdery, pure white, very long, scarcely branched, clothed with horizontal, twisted, simple, ash-coloured fibres."—Found on the branches of trees, in the woods of Lusatia. The *frond* is slender, with a few *branches*, two, three, or four feet in length. *Receptacles* unknown. *Acharius*.

10. U. *angulata*. Angular Usnea. Ach. Syn. n. 9.—"Frond pendulous, nearly simple, zigzag, pale grey, with acute rough angles; fibres horizontal, crowded, simple, short, round, tapering."—Native of trees in North America. *Fructification* unknown. At first sight this species resembles the variety c, *strigosa*, of *U. florida*, but is more related to *longissima*, from which, as well as from the rest of the genus, it is sufficiently distinguishable by the conformation of the *frond*. *Acharius*.

11. U. *trichoidea*. Capillary Usnea. Ach. Syn. n. 10. Meth. 312. t. 8. f. 1.—Frond prostrate, smooth, whitish, thread-shaped, very slender, branched; fibres horizontal, scattered, partly turned one way. Disks of the same colour, terminal, with a narrow, elevated, naked, entire border.—Found in Nova Scotia, at the Cape of Good Hope, and in the isle of Java. Differs from the rest of its genus in the capillary, spreading, not pendulous, *frond*, and in the want of rays to its *disks*, which are very slightly concave. The medullary thread is blackish; the cortical substance crustaceous, thin, scarcely jointed. *Ach. Meth.*

12. U. *gracilis*. Slender Usnea. Ach. Syn. n. 11. Nov. Act. Upsal. with a figure, unpublished.—"Frond pendulous, white, very smooth and shining, thread-shaped: branches scattered, uniform, straight, simple, slightly fibrous."—Native of the isle of Bourbon. Acharius thinks this a distinct species, though he never met with the *fructification*.

13. U. *filaris*. Greenish Thread Usnea. Ach. Syn. n. 12. ("U. gracilis; Pers. in Act. Soc. Wetteran. 2. t. 10. f. 6.")—"Frond thread-shaped, greenish. Disks scattered, small, fringed with bristles."—Native of America. *Persoon*. Acharius had not seen a specimen, but he conceived this species to be really distinct from the last, and was, therefore, obliged to change Persoon's specific name.

14. U. *incarnata*. Red-pithed Usnea.—Frond pendulous, pale, smooth, capillary, cracked, with numerous horizontal tapering fibres; the medullary thread reddish. Disks lateral, concave, fringed with long distant bristles.—Gathered in Nova Scotia, by Mr. Archibald Menzies, to whom we are obliged for specimens. We cannot refer them to any of the preceding species, but without a comparison with some of those, particularly the two last, the question must remain in a little uncertainty. The *fronds* are six inches long, of an ivory white, polished, not at all warty or powdery, very slender, copiously cracked, but not tumid nor inflated; the central thread, when laid bare, appearing of a flesh-colour, or light red. *Disks* copious, small, slightly reddish, with a thick inflexed border, beset with a few unequal, rather long, spreading bristles. In a young state, when smaller than mustard-seed, they greatly resemble the shields of a *Parmelia*.

15. U. *denudata*. Naked-branched Usnea.—Frond thread-shaped, tawny, greenish, rough with minute points, subdivided, destitute of lateral fibres. Disks lateral, flat, glaucous, fringed with tapering bristles.—Gathered by Mr. Menzies in Otaheité. We cannot tell whether this be pendulous or erect, but the *frond* and *branches* are all nearly of equal thickness, without any fine tapering lateral fibres or subdivisions. They are slightly cracked here and there, but not tumid; their colour partly tawny, partly a dirty greenish-white. *Disks* ranged along the uninterrupted frond; when young globular, concave, naked at the edge; finally flat, a quarter of an inch wide, brown, with a glaucous bloom; their border narrow, wavy, slightly elevated, more or less copiously fringed with cracked bristles; very unequal in length.

USNEN, a name given by Avicenna and Serapion to the plant kali, of which the alkali salt called *pot-ashes*, and used in the compounding of our soap, is made. There are also several other things called by this name, and, in general, all that were used in the scouring or cleaning of clothes. The dung of sparrows was used by some people for this purpose, as the dung of hogs is at this time; and this was, therefore, called by some *usnen*. Hyssop, a plant famous for its cleansing virtue, was also called by the same name; and some have also applied it to the soldanella, or sea bind-weed.

Wherever, in the Arabian writers, the word *usnen* is used in any of these latter senses, there is something added to distinguish which of the things before expressed is meant by it; but whenever it stands alone and unexplained, it is to be understood as meaning the kali.

USOZA, in *Geography*, a river of Russia, which runs into the Svopa, near Phatez, in the government of Kursk.

USPALLATA, a spacious plain, about 50 miles long and 6 broad, situated on the eastern mountains of the Andes, in the province of Acancagua, which gives name to the most celebrated silver mine, as Chili. The vein of silver, on the skirts of the eastern chain of this plain, has been traced to the enormous length of 90 miles; nor is its termination yet fixed. It is supposed by many to extend to Potosi, which lies in the same direction, or through a space of 14°, or 840 geographical miles. The grand vein is always nine feet in thickness, and on both sides throws off numerous branches, which may be said to penetrate a chain of mountains 30 miles in breadth. This productive mine, though discovered in 1638, was neglected till the year 1762, when the people of Mendoza, a town not far from Uspallata, invited two expert miners from Peru; and they continued to work the mine with prodigious advantage.

USPENSKOE, a town of Russia, in the government of Ekaterinoslav; 16 miles S. of Donetzk.

USPENSKOI, a town of Russia, in the province of Ustiug; 28 miles S. of Ustiug.—Also, a town of Russia, in the government of Archangel; 80 miles S. of Kola.

USQUEBAUGH, a strong, rich, compound liquor, chiefly taken by way of dram; its basis being brandy, or a more ordinary spirit.

The manner of making it is somewhat various, and the ingredients numerous. We shall give a receipt, much commended formerly, as a specimen.

To two gallons of brandy, or spirits, put a pound of Spanish liquorice, half a pound of raisins of the sun, four ounces of currants, three of dates, sliced; tops of thyme, baum, savory, and mint, and tops or flowers of rosemary, of each two ounces; cinnamon and mace bruised, nutmegs, aniseeds, and coriander-seeds, bruised likewise, of each four ounces; citron, or lemon and orange-peel, scraped, of each an ounce: all these are to be left to infuse forty-eight hours in a warm place, often shaking them together; then set them in a cool place, for a week; after which, the clear liquor is to be decanted off, and to it is to be put an equal quantity of net white port-wine, and a gallon of canary. The whole is finally to be sweetened with a proper quantity of double refined sugar.

USRENUS, in *Ancient Geography*, a river of Asia, in Syria, which had its source in a branch of mount Amanus, and by a south-west course discharged itself into a lake, near the gulf called Issicus.

USSAC, in the *Materia Medica of the Arabians*, a name given by Serapio to the gum ammoniacum of the Greek writers. It seems no other than a false spelling of the word *assac*, which is the common name of the gum in Avicenna, and other of the writers of that nation; but this does not seem to be the same drug, which we call gum ammoniacum at this time.

USSARA, in *Ancient Geography*, a town of Africa, in Mauritania Cæsariensis, situated in the vicinity of Lamida.

USSASI, or USSASYE, in *Botany*. Rumph. Amboin. v. 3. 60. t. 33. Poiret in Lamarck Dict. v. 8. 261. This is a tree found in Ceram, and some other spice islands, but not in Amboyna. Its stature equals the Lemon-tree. *Branches* opposite, crossing each other in pairs; quadrangular when young. *Leaves* opposite, stalked, ovate, acute, entire, single-ribbed, from four to six or seven inches long, and the breadth of three or four fingers, nearly smooth, of an acid, not unpleasant, flavour, like that of an unripe grape. *Fruit* lateral, sessile, irregularly ovate, or somewhat globular, green, various in size, with a thin tough skin, inclosing a watery acidulous grateful pulp, full of numerous thin flat *seeds*, like those of a cucumber, or gourd. The smaller-fruited variety, perhaps a distinct species, has a firmer pulp, with only four or five *seeds*. Both kinds raise the base of the *stem*, upon forked *roots*, high out of the ground. Nothing is known of the parts of the *flower*, nor indeed of the true structure of the *fruit*, by which these plants could be scientifically described or classed.

USSASSYR, in *Geography*, one of the Kurile islands, which lies 17 versts from Rassagu, and in length and breadth may be 25 versts each. It consists properly of two islands lying close together, composed of considerable rocks and cliffs. Opening to the south is a round bay, in the shape of a kettle encompassed with hills, where the strand is sandy; and along it, as well as on the sea-shore, runs a source of almost hot water, and not far from it another. Here too are some spouts, running strong, and throwing the water to a considerable height in the air. In many places are perceived chaps and chasms in the earth, 100 fathoms in length, and sometimes more. Near the great spout the shore is steep and high, producing large lumps of sulphur and salmiak, which partly fall down, and partly are collected there. In other respects, the island is like *Rassagu*; which see.

USSEL, a town of France, and principal place of a district, in the department of the Correze; 32 miles E.N.E. of Uzerches. N. lat. 45° 33′. E. long. 2° 23′.

USSES, a river of France, which runs into the Rhône, near Seissel.

USSETA, a town of the state of Georgia; 160 miles W.S.W. of Augusta.

USSITERNA, a town of Servia; 24 miles W. of Pistrina.

USSITZA, a town of Servia; 32 miles W.N.W. of Novibasar.

USSON, a town of France, in the department of the Puy-de-Dôme; 16 miles W. of Ambert.—Also, a town of France, in the department of the Vienne; 12 miles N.E. of Civray.

USSORA, a river of Bosnia, which runs into the river Bosna; 32 miles N. of Serajo.

USSUBUM, in *Ancient Geography*, a place marked in the Itin. of Anton. on the route from Bourdeaux to Agen, between Sarione and Fines.

USSUI, in *Geography*, a town of Japan, in the island of Niphon; 86 miles N.W. of Jedo.

USTAK, a town of Natolia; 22 miles N. of Karahisin.

USTARITZ, a town of France, and principal place of a district, in the department of the Lower Pyrenées; 48 miles W. of Pau. N. lat. 43° 23′. W. long. 1° 23′.

USTAYANTHO, a lake of New York, from which the river Delaware takes its rise.

USTCHOTZKOI, three islands on the west coast of Kamtschatka. N. lat. 57° 10′. E. long. 156° 14′.

USTERIA, in *Botany*, so named by Willdenow, in honour of Dr. Paul Usteri, of Zurich, member of several learned academies, as well as of the legislative body of his own country, and well known by his very useful periodical compilation, entitled *Annalen der Botanick*, as well as by the *Magazin für die Botanik*, edited by Römer and himself. These works extend to many octavo volumes, and have been eminently serviceable to German readers, in making them acquainted with some of the most valuable and expensive botanical publications of other countries, at a cheap rate; several of such works being copied entire in these volumes. Willd. in Röm. and Ust. Mag. fasc. 8. 151, without a name. Act. Soc. Berol. v. 10. 52. t. 2. Schreb. Gen. 782. Willd. Sp. Pl. v. 1. 18. Mart. Mill. Dict. v. 4. Afzel. Gen. Pl. Guineens. part 1. 1—11, with a figure.—Class and order, *Monandria Monogynia*. Nat. Ord. *Rubiaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, four-cleft, permanent; the three inner segments minute, close-pressed, acute; the outer one very large, petal-like, horizontal, linear-lanceolate, very blunt. *Cor.* of one petal, salver-shaped, deciduous: tube narrow, cylindrical, twice the length of the longest segment of the calyx: limb in four deep, lanceolate, acute, unequal segments, rather turned to one side. *Stam.* Filament solitary, short, tapering, inserted into the margin of the tube, between the two larger segments of the limb; anther prominent, arrow-shaped, versatile, of two oblong diverging cells. *Pist.* Germen superior, ovate-conical; style thread-shaped, longer than the tube of the corolla; stigma quite simple, slightly corrugated. *Peric.* Capsule ovate-oblong, compressed, with two furrows, two, partly cloven, concave valves, and two cells, the partition transverse, double, from the inflexed parallel margins of the valves,

valves, so that the capsule easily separates into two lobes. *Seeds* imbricated in two rows, upon a large, deciduous, convex, longitudinal *receptacle* in each cell, numerous, ovate, peltate, depressed, small, obtuse, each encompassed with a large, nearly orbicular, cellular, reticulated wing.

Eff. Ch. Calyx four-cleft; the outer segment very large. Corolla salver-shaped, four-cleft. Capsule of two cells, with inflexed partitions. Seeds imbricated, winged.

Obs. We have adopted Dr. Afzelius's more accurate description of this curious and very distinct genus, compared with dried specimens. That of Willdenow is in many respects very incorrect; nor can all his mistakes be well accounted for. He took the *receptacle* for a solitary *seed*.

1. U. *volubilis*. Twining Usteria. Afzel. as above, five. (U. guineansis; Willd. n. 1. Monodynamis Isferti; Gmel. Syst. Nat. Linn. v. 2. 10.)—Native of the Guinea coast, especially of the hills of Sierra Leone, and of Bananas and Plantain islands, in dry stony places, where Dr. Afzelius found it in great abundance, flowering from September to December, and bearing ripe capsules from February to May. The negroes know this plant by the name of *Makbòt*, or *Makbòt-T'bòt*. Willdenow received it from Mr. Isert, see Isertia; but the first specimens ever brought to Europe by any botanist, were those of Mr. Smeathman, many years before. The *stem* is shrubby, with long, slender, round, smoothish, opposite, twining *branches*, supporting themselves on any thing that stands in their way; their bark, when first tasted, sweetish, afterwards bitter. *Leaves* stalked, opposite, crossing each other in pairs, elliptical, entire, smooth, from two to four inches long, bluntish, with one rib, and many transverse veins. *Footstalks* two or three lines long, connected by a very short, annular, intrafoliaceous *stipula*. *Panicles* terminal and axillary, large, compound, corymbose, forked, finely downy or hoary, as well as the *calyx*, and the tube of the white, or partly violet, *corolla*. *Capsule* one inch and a quarter long, much resembling that of a *Cinchona*, to which genus this plant is naturally allied, though so distinct in its flower. Dr. Afzelius confirms this affinity, by informing us that the natives of Guinea sometimes cure fevers with an infusion of the leaves and young branches.

Usteria is also the name of a genus in Cavanilles' Icones, v. 2. 15. t. 116, now called Maurandia; see that article.

USTIA, in *Geography*, a town of European Turkey, in Moldavia, on the Dniester; 88 miles E. of Jassy.

USTJAK, a town of Asiatic Turkey, in Natolia; 20 miles N. of Kiutaja.

USTIANO, a town of Italy, in the department of the Mincio, on the Oglio; 26 miles W. of Mantua.

USTICA, an island in the vicinity of Sicily, with a town of the same name. It was opposite to Pacopus, and appears as one of the Lipari islands. This island was for centuries uninhabited, except by some wild goats, till, in the year 1765, a citadel was built here, furnished with a garrison: at the same time a colony was sent, which flourishes, though the island is without springs, and only supplied with fresh water by rain kept in cisterns; 25 miles from the coast of Sicily. N. lat. 38° 44′. E. long. 13° 36′.

USTILAGO, in *Botany*. See Uredo.

USTION, *Ustio*, formed from *urere, to burn*, in *Pharmacy*, the preparing of certain substances, by burning them.

The ancients made use of burnt horns, nails, feathers, and other parts of animals, for divers remedies; and the moderns still use æs ustum, which is burnt copper, or copper that has undergone the ustion, with sulphur.

The ustion of minerals is a more imperfect kind of calcination. It is a degree beyond torrefaction.

USTIUG, or Veliki, in *Geography*, a town of Russia, and capital of a province, in the government of Vologda, situated on the Dwina, at the conflux of the Suchona and the Jug, the see of an archbishop. It contains ten or twelve churches, built of stone, with some others, which, with the houses, are of wood. The merchants are numerous, and great quantities of grain are sent to different parts. The city is chiefly on the left side of the Dwina; 1002 miles from Petersburg. In order to characterise the weather of the northern region of Russia, we observe, that Ustiug lies 516 miles from the nearest shore of the Frozen ocean, and $15\frac{1}{2}$° more to the N. than St. Petersburg: and that the mean heat and cold here is above Reaumur's freezing point in the month of April until September; below the freezing point in the month of October until March. The mercury in the same thermometer, in the month of June alone, falls never below 0, and only in January never rises above 0. The cold increased at times so late as in the middle of April to 30°, and the quicksilver may, sometimes so early as November, and again in the first days of March, be hammered. In every winter are 120 days, in which the cold is more than 5°; and of these, 65 days in which it exceeds 10°; yet the summer has more hot than the winter has cold days. The thermometer stood, upon an average of several years, the whole day above 0, on 152 days, and below 0, on 150; and consequently there were 63 days on which it stood alternately above and below 0. The rivers are navigable about the 10th of May; at the end of that month the summer corn is sown, and about the middle of June the fields are manured for winter sowing: the harvest is commonly in August. The trees shed their leaves sometimes so early as the 10th of August, but usually about the 20th. On the 4th of November, 1786, the quicksilver froze in the open air, during a cold of $30\frac{1}{2}$° of Reaumur's thermometer; the 1st of December, at 40°, it fell the same day to 51°, and the 7th of December was down to 60°. The quicksilver then froze to a solid mass, so as to bear beating with a hammer, in a warm room, several times before any pieces flew off from it. See the Observations of Mr. Fries, in Crell's Annals, 1787, p. 2, cited in Tooke's Russia, vol. i. N. lat. 60° 50′. E. long. 45° 40′.

Ustiug, a province of Russia, and by far the most considerable part of the government of Vologda, being 400 miles in length, and 240 in breadth.

USTIUZNA, a town of Russia, in the government of Novgorod, on the river Mologa; 144 miles E. of Novgorod.

USTRINA, among the Romans, the place where they burnt the bodies of the dead. It was commonly in the Campus Martius, or some other place in the suburbs, and sometimes in the city for persons of quality; and for the common people on the Esquiline mount. See Bustum.

USTVIANSKOI, in *Geography*, an ostrog of Russia, in the government of Irkutsk, on the Yana. N. lat. 70° 30′. E. long. 131° 38′.

USTULATION, *Ustulatio*, a word used by pharmaceutic writers to express the roasting or torrefying of humid or moist substances over a gentle fire, so as to render them fit for powdering. The same word is also used by some for what we call burning of wine.

USTUM, Æs. See Æs *Ustum*.

USTURANTZKOI, in *Geography*, a fortress of Russia, in the government of Irkutsk, on the borders of China; 76 miles S. of Selenginsk.

USUBIS, in *Botany*, a name of Burmann's. See SCHMIDELIA

USUCAPTION, *Usucaptio*, in the *Civil Law*, is an acquisition of the property of a thing by a possession and enjoyment of it for a certain term of years prescribed by law.

Some make a difference between prescription and usucaption; maintaining that the latter is only used with regard to moveables, and the former with regard to immoveables. But there is no essential difference between them; and, accordingly, prescription and usucaption are generally held synonyma.

Usucaption denotes the acquisition of domain founded on a long possession uninterrupted and undisputed, or on an acquisition solely proved by this possession. Wolf defines it, an acquisition of domain founded on a presumed desertion; by which definition he explains the manner in which a long and peaceable possession may serve to establish the acquisition of domain. Modestinus says, in conformity to the principles of the Roman law, that usucaption is the acquisition of domain from a continued possession, during a time expressed by the law. These three definitions, says Vattel, are not incompatible with each other. Prescription is the exclusion of all pretensions to a right founded on the length of time during which it has been neglected; or, as Wolf defines it, the loss of a proper right in virtue of a presumed consent: this definition is allowed by Vattel to be just; that is, to explain how a long neglect of a right occasions its being lost; and it agrees with the nominal definition which he has given, and in which he explains what is commonly understood by this term. Usucaption, however, is a term little used; prescription being adopted in lieu of it. Many celebrated authors (Grotius, Puffendorf, and Wolfius) have asserted and proved, that usucaption and prescription are derived from the law of nature; and Vattel has investigated and established this point, which some others have disputed. Nature, says this excellent writer, has not herself established property with respect to wealth, and in particular with regard to lands: she only approves this introduction, for the advantage of the human race. It would therefore be absurd to say, that domain and property being once established, the law of nature can secure to a proprietor any right capable of introducing disorder into human society. Far from giving such a right, the law of nature prescribes to the proprietor the care of what belongs to him, and lays him under an obligation to make known his right, that others may not be led into an error: for nature does not approve his property, and only secures it to him on those conditions. If he neglects this for a time long enough not to be admitted to reclaim it, without endangering the rights of others, the law of nature will not permit him to reclaim it. Why does the law of nature order all to respect this right of property in him who possesses it, if it be not for the peace, safety, and advantage of human society? Nature must then, from the same reason, require that every proprietor, who for a long time, and without any just reason, neglects his right, should be presumed to have entirely renounced and abandoned it. This forms the absolute presumption, or *juris et de jure*, of its being abandoned, and upon which another is legally entitled to appropriate the thing abandoned to himself. This presumption composes a title as firm and just as that of property itself, established and supported by the same reasons. The honest possessor, who had founded a presumption of this kind, has then a right approved by the law of nature; and this law, which requires that the right of every one should be firm and certain, does not permit their being disturbed in their possession.

The right of usucaption properly signifies, that the honest possessor is not obliged to suffer his property to be disputed; he proves this by his possession itself, and he repulses the demand of the pretended proprietor by prescription. Nothing can be more equitable than this rule. Prescription, being only founded on an absolute or lawful presumption, has no place, if the proprietor has not really neglected his rights. This condition implies: 1. That the proprietor cannot allege an invincible ignorance, either on his own part, or on that of his friends: 2. That he cannot justify his silence by lawful and solid reasons: 3. That he has neglected his right or kept silence during a considerable number of years. These remarks relate to *ordinary* prescription. *Immemorial* prescription, founded on immemorial possession, that is, on a possession, the origin of which is unknown or obscure, secures the possessor's right, and it cannot be taken from him.

Usucaption and prescription, founded on the law of nature, form a part of the law of nations, and ought to take place between different states: for the law of nations is nothing but the application of the law of nature to nations, rendered, in a manner, suitable to the subject: and so far is the nature of the subject from forming here any exception, that usucaption and prescription are much more necessarily used between sovereign states than between individuals. However, they are often more difficult in their application to nations, as these rights are founded on a prescription drawn from a long silence. The tranquillity of the people, the safety of states, the happiness of the human race, do not allow that the possessions, empire, and other rights of nations, should remain uncertain, subject to dispute, and always ready to occasion bloody wars. It is, therefore, necessary to admit between nations a prescription founded on a long interval of time, as a solid and incontestible method. Usucaption and prescription being necessary to the tranquillity and happiness of human society, it is justly presumed that all nations have consented to admit the use of them as lawful and reasonable, with a view to the common advantage, and even to the particular benefit of each nation. Prescription of many years standing, as well as usucaption, is therefore established by the voluntary law of nations. Vattel's Law of Nations, b. ii. ch. 11. See PRESCRIPTION.

USUFRUIT, *Usus fructus*, in the *Civil Law*, the temporary use or enjoyment of any lands or tenements; or the right of receiving the fruits and profits of an inheritance, or other thing, without a power of alienating or changing the property thereof.

When the usufructuary dies, the usufruit returns to the proprietor. The dower of the jointure of a widow is only an usufructuary due; that is, she only enjoys the usufruit thereof, and cannot dispose of the principal.

All mutual presents between man and wife only import the usufruit of the goods of the first that dies, to the profit of the survivor. The incumbents of benefices are only usufructuary. An usufructuary has full right over the coppice, but he cannot fell timber-trees.

USUM, in *Geography*, a river of Romania, which runs into the Mariza, 4 miles S.E. of Affarli.

USURA *Maritima*, terms applied to contracts for the repayment of money borrowed, not on the ship and goods only, but on the mere hazard of the voyage itself; as when a man lends a merchant 1000*l.* to be employed in a beneficial

cial trade, with condition to be repaid with extraordinary interest, in case such a voyage be safely performed. This kind of agreement is sometimes called *fœnus nauticum*. See Bottomry, and Respondentia.

USURER, a person charged with a habit or act of usury.

The laws of our ancient Saxon and Norman kings are very severe upon usurers, or letters-out of money upon interest. "Usurarios quoque defendit rex Edvardus (Confessor), ne remaneret aliquis in toto regno suo; & si quis inde convictus esset, quod fœnus exegerat, omni substantia propria careret, & postea pro ex lege habeatur: quoniam usura radix omnium malorum." Leg. Edv. Confess. cap. 37.

They were, indeed, allowed to dispose of their goods before conviction, and whilst they were living; but after their death they were confiscate, if it could be proved they lent money to use within a year before their death.

If a clergyman were an usurer, his goods were not to be confiscated, but to be distributed to pious uses. In those days usury was thus defined:

> "Est usura suos quisquis tradit mihi nummos
> Spe lucri, fœnus duplex usura vocatur."

USURIOUS *Contract* is any bargain, or contract, where a man is obliged to pay more interest for money than the statute allows.

It is enacted by statute 13 Eliz. cap. 8. that all brokers shall be guilty of a *præmunire*, who transact any usurious contract where more than ten *per cent*. interest is taken.

USURPATION, in *Law*, an injurious using or enjoyment of a thing for continuance of time, that belongs of right to another. See Tyranny.

Usurpation, in a more peculiar sense, denotes an absolute ouster or dispossession of the patron of a church; and happens when a stranger, that hath no right, presenteth a clerk, and he is thereupon admitted and instituted. In which case of usurpation, the patron lost by the common law not only his turn of presenting *pro hac vice*, but also the absolute and perpetual inheritance of the advowson, so that he could not present again upon the next avoidance, unless in the mean time he recovered his right by a real action, *viz.* a writ of right of advowson. However, because bishops, in ancient times, either by carelessness or collusion, frequently instituted clerks upon the presentation of usurpers, and thereby defrauded the real patrons of their right of possession, it was in substance enacted by the statute Westm. 2. 13 Edw. I. cap. 5. sect. 2. that if a possessory action be brought within six months after the avoidance, the patron shall (notwithstanding such usurpation and institution) recover that very presentation which gives back to him the seisin of the advowson. Yet still, if the true patron omitted to bring his action within six months, the seisin was gained by the usurper, and the patron to recover it was driven to the long and hazardous process of a writ of right. To remedy which, it was further enacted by statute 7 Ann. cap. 18. that no usurpation shall displace the estate or interest of the patron, or turn it to a mere right; but that the true patron may present upon the next avoidance, as if no such usurpation had happened. So that the title of usurpation is now much narrowed, and the law stands upon this reasonable foundation, that if a stranger usurps my presentation, and I do not pursue my right within six months, I shall lose that turn without remedy, for the peace of the church, and as a punishment for my own negligence; but that turn is the only one I shall lose thereby. Usurpation now gains no right to the usurper, with regard to any future avoidance, but only to the present vacancy: it cannot indeed be remedied after six months are past; but, during those six months, it is only a species of disturbance. Blackst. Comm. book iii.

Usurpation *of Franchises and Liberties*, is when a subject unjustly uses any royal franchises, &c. And this is said to be an usurpation upon the king, who shall have the writ of quo warranto against the usurpers.

USURY, Usura, in the general, denotes a gain or profit which a person makes of his money, by lending the same; or it is an increase of the principal exacted for the loan thereof; or the price a borrower gives for the use of a sum credited to him by the lender: called also *interest*, and in some ancient statutes, *dry exchange*. For lawful interest, see Interest.

The word usury is usually taken in an evil sense; *viz.* for an unlawful profit which a person makes of his money; in which sense it is, that usury is forbidden by the civil and ecclesiastical law, and even by the law of nature. In this sense it also is, that it is held usury to lend money on pawns, to exact interest for money, without surrendering the principal, and to stipulate interest for money which is not employed in trade, nor brings any profit to the person who receives it: but, as the Latin word *usura*, at least the plural of it, *usuræ*, may be understood of a lawful interest, *usury*, in English, might also be used in the same harmless sense.

Use or interest, by the civil law, is divided into *lucrative* and *compensatory*. Lucrative is, when it is paid where there hath been no advantage made by the debtor, and no delay or deceit in him: and this is condemned by the civil law. Compensatory is, when it is given, where the thing lent hath been advantageous to the debtor, and disadvantageous to the creditor that he was not sooner paid: and this is permitted by that law. Wood. Civ. L. 213.

And by the civil law (Swinburn tells us), a manifest usurer cannot make a testament; and though he make one, it is void in law concerning goods and chattels, unless he satisfy for the usury, or put in caution for satisfaction to be made. Swinb. 101.

And as manifest usurers are forbidden to make testaments themselves, or to dispose of their goods by their last wills; so are they forbidden to reap any benefit by the testament of others, or to be capable of any legacy of goods. Swinb. 376.

These are the anathemas of the popes, and not the rescripts of the emperors. (See Cod. 5. 5.) The punishment by the civil law was once a quadruple penalty, (L. 2. Cod. Theod. de Usuris,) but this seems to have been mitigated by Justinian, who contents himself with declaring that whatever is paid more than the legal interest, shall be accounted part of the principal. Cod. 4. 32. 26. Noodt, de Fœn. et Us. lib. 2. cap. 16.

By a constitution of Edmund archbishop of Canterbury; "We forbid any man to detain a pledge, after he hath received the principal out of the profits, after deduction of the expences, for this is usury." Lind. 160. The pledge in this case must be supposed to be lands, cattle, or such like, out of which a profit ariseth. Johns.

And by Can. 109. If any offend their brethren by —— usury; the churchwardens or questmen and sidemen, in the next presentments to their ordinaries, shall faithfully present every such offender, to the intent that he may be punished by the severity of the laws, according to his deserts; and such notorious offenders shall not be admitted to the holy communion, till they be reformed.

And in general, it is said, that by the ecclesiastical laws, if a man be a manifest usurer, not only his testament is void (as hath been said); but his body, after he is dead, is not

to be buried amongst the bodies of other Christian men, in any church or churchyard, until there be restitution or caution tendered, according to the value of such goods. Swinb. 102.

Most of the early fathers of the church have condemned usury in the strictest sense, *i. e.* any profit made of the loan of money, as contrary to the divine law. Alexander III. in the council of Lateran, prohibited the taking of all interest for money; and it has been observed, that Gregory IX. places the chapter of usury after that of theft. But the Mosaic law, though it forbade the Jews to take interest from their brethren, allowed them to take interest from strangers, or to borrow from them on the same terms; and that this law has not condemned the lending of money on interest as *malum in se*, and contrary to the law of nature and of nations, which many have thought, but merely prohibited it amongst the Jews, as dangerous in a political view, considering their itinerant and agricultural life, has been ably demonstrated by Noodt in his Treatise de Fœnore et Usuris, c. 10. and 11. (See INTEREST.) Nearly the same regulations obtained amongst the Romans in the infancy of the republic; but when commerce was introduced amongst them, the contract of lending money at a certain profit became frequent. The highest rate of legal interest among the Romans, from the time of Cicero and Justinian, was the *centesima* or twelfth part paid every month, amounting to 12 *per cent. per annum*; but the satirists inform us that some usurers exacted three, four, or even five times that profit. Justinian in his code fixed the legal rate of interest at 4, 6, 8, or 12 *per cent.* according to the station of the lender and the nature of the contract. (Cod. 4. 32. 26.) Various evasions of the laws, however, were practised at Rome, and some of these were not unknown to the canonists; for usurious profit might be secured under the contract of a sale and repurchase, or letting to hire, or might be stipulated for in consideration of the gain of the borrower, or of the loss which the lender suffered by the detention of his money. To these, modern money lenders have added the purchase of annuities, in which, as the purchaser risks his capital, he is allowed to take a greater share of interest, though this must be within equitable bounds. (Vaughan v. Thomas, 1 Bro. 556. Heathcote v. Paignon, 2 Bro. 167.) But if any of these transactions appear from circumstantial evidence to be merely the covering of an usurious contract, they are held to be within the statute of Ann. See Chesterfield v. Janssen, 2 Vesey, 125.

By the laws of king Alfred, it was ordained, that the chattels of usurers should be forfeited to the king, their lands and inheritances should escheat to the lords of the fee, and they should not be buried in the sanctuary. Swinb. 102. 1 Haw. 245.

Also it seems to have been the opinion of the makers of divers acts of parliament since the Reformation, that all kinds of usury are contrary to good conscience. 1 Haw. 245.

However, custom has now distinguished betwixt usury and legal interest; and appropriated the term usury to that which exceeds the interest determined by statute. The legal interest is five *per cent.* by 12 Anne, st. 2. cap. 16. commonly called the statute against usury, which ordains not only that all contracts for taking more than 5*l.* *per cent.* and proportionably for a greater or less sum, are in themselves totally void, but also that the lender shall forfeit treble the value of the money borrowed. And farther, if any scrivener or solicitor takes more than 5*s.* *per cent.* procuration money, or more than 12*d.* above the stamp duties for making a bond or bill for loan or forbearing thereof, or for any counter-bond or bill concerning the same, he shall forfeit 20*l.* with costs, and shall suffer imprisonment for half a year.

As this act declares all usurious contracts void, the indorsee of a bill of exchange give nupon an usurious consideration cannot recover, although he had no notice of the usury, and had given a valuable consideration for the bill. (Low v. Waller, Doug. 736.) And if more than the principal and legal interest be paid, an action will lie to recover the surplus: *per* Ld. Mansfield, in Smith v. Bromley, Ib. 696.

In these days, a distinction seemeth to be made betwixt usury and legal interest: for what exceedeth the legal interest is properly usury; and he who exacteth it seemeth still to be punishable as an usurer. 1 Dom. 126.

And, upon the whole, it seemeth now to be generally agreed, that the taking of reasonable interest for the use of money is in itself lawful, and consequently that a covenant or promise to pay it, in consideration of the forbearance of a debt, will maintain an action. See INTEREST.

The usury laws have lately become a subject of parliamentary and public discussion; and an excellent treatise of Mr. Jeremy Bentham, of which a new edition was published in 1816, has claimed peculiar attention. The prejudices in which these laws had their foundation maintained their ground, notwithstanding the ruins of the mercantile system to which they naturally belong; and they soon derived support from an opinion in their favour, delivered by Dr. Smith, in a work which powerfully operated towards dispelling the other errors of the mercantile theory. Mr. Bentham was the first writer who openly and systematically attacked them, and this he did with such success, as to produce a general conviction of their injustice and impolicy. He ascribes, perhaps, too much importance to religious bigotry: to this purpose, he observes that the practice of self-denial was substituted at a very early period for active virtue; and as the greater the temptation the greater the merit, much virtue was arrogated to themselves by those who declined the use of means for making money, which was generally regarded as a favourite pursuit. Hence, he says, the obvious method of making wealth productive, by lending it for a profit, was proscribed as an illegal gratification; and besides, as the Jews were much addicted to this practice, and had the money-trade principally in their own hands, the Christians, very anxious to avoid their customs, deemed it peculiarly sinful. The authority of Aristotle had also great weight in determining the judgment and conduct. (See INTEREST.) Our author also remarks, that the natural antipathy of the spendthrift towards the saving man, arising from the envy with which he regards him, had no inconsiderable influence. To which it may be added, the feeling excited *against* a rich man, as the trader must always be compared with the borrower, and in *favour* of a poor one, by the very circumstance of the former making the latter pay for half, according to his necessities, and reaping a profit without any labour or even trouble on his own part. The reasons commonly alleged in justification of the laws against usury have been such as follows; the first is the prevention of prodigality. Mr. Bentham replies, that if this be a good work at all, it is at least a work of supererogation, but in reality, the restraints under consideration do not operate in this way. Would any man of sound mind think of giving six *per cent.* for the use of money, howsoever pressing his wants, if he could get it for five! Or, can a man, however prodigal, be prevented from selling all he can get rid of by sale, and pledging all which he cannot sell? Those who have security of any kind to offer the lender are not protected by the law; for the lender never makes his bargain upon a view of the borrower's character and habits, but

but of his security. If the spendthrift has no security to offer, how is he more likely to get money at a high than at a low rate? A friend is the only person likely to accommodate him, and he will not take more than the ordinary rate. Prodigals usually borrow money in moderate sums, at the usual rate, in various quantities; and when they can find a lender disposed to speculate, and obtain a compensation for the great risk of trusting them in the high profits of the transaction, such a person will neglect the prohibitions of the usury laws, and make the poor man pay so much more for the additional risk they make him run. Besides, the most certain road to ruin for all prodigals is to obtain goods upon credit, as long as their credit lasts, and here no law interferes.

The protection of indigence is *another* reason urged in behalf of these restraints: but it may be asked, Can any one rate of interest be adapted to every man's situation? To some it may be profitable to borrow even at ten *per cent.*, whilst others may find six *per cent.* too high, compared with the sum in prospect, whereas the usury laws determine one standard of exigency for all. This arrangement operates, not in protecting, which is the pretext, but in crushing the indigent. If the protection of indigence were the object of these laws, they stop short of their pretended object: they without doubt prevent a poor man from borrowing at a high rate; but they take no means of compelling the rich to lend him at a lower rate.

A *third* reason alleged is the protection of simplicity. But how simple must that man be who gives more than he knows, or may easily learn to be necessary, for the use of money! Nothing may be more easily ascertained than the market rate of interest. It is to a very great degree invariable, and it is the same throughout the whole community. A simple man, or a man who is not very simple, may be deceived in other bargains; but in case of loans, the legislator neither does, nor can afford, him the least assistance. The unwary borrower has always the security in his own hands; and if he has been really over-reached, he can have no difficulty in obtaining redress. If, indeed, persons may be supposed to be so simple as to need protection in their money bargains, they are exposed to as great a danger in all their other transactions, in which no lawgiver ever dreamed of affording protection to simplicity.

As a *fourth* reason in favour of these restraints, it is alleged that a free access to the money-market tends to encourage projectors. Dr. Smith has very much contributed to the prevalence of this notion. He classes projectors with prodigals; stigmatizes both as persons likely to waste the capital of the community, and approves of the *maximum* for its tendency to keep a portion of that capital out of their hands. We cannot, within our limits, do justice to Mr. Bentham's elaborate refutation of this dogma, and the exposition of the prejudices upon which it is founded.

The restraint, as he justly remarks, professing to fall upon rash, imprudent, useless schemers, does in fact fall upon such persons as, in the "pursuit of wealth, or even of any other object, endeavour, by the assistance of wealth, to strike into any channel of invention. It falls upon all such persons as, in the cultivation of any of those arts which have been by way of eminence termed *useful*, direct their endeavours to any of those departments in which their utility shines most conspicuous and indubitable; upon all such persons as, in the line of any of their pursuits, aim at any thing that can be called *improvement;* whether it consist in the production of any new article adapted to man's use, or in the meliorating the quality, or diminishing the expence, of any of those which are already known to us. It falls, in short, upon every application of the human powers, in which ingenuity stands in need of wealth for its assistant."

It is indeed manifest, that, in this view, the usury laws are absurd, unless it be possible to distinguish, before trial, good from bad, that is, successful from losing projects; in which case, the law ought to fix a *maximum* for the loans to the one, and leave the other free access to the market,—which is plainly impossible. Those who are too prudent to risk their money upon an unpromising scheme, will risk it upon no scheme at all, but will lend only to established concerns. The temptation of higher profit than usual is absolutely necessary, to prevail upon capitalists to embark in new trades. The usury laws prevent, therefore, any capital from finding its way into those channels by way of loan, and directly discourage projects, that is, invention and improvement in all the arts of life; for, without discouraging the useful and the good, they cannot discourage the wild and the bad. Shall we then say, that the danger to the capital of the community, from a failure of certain schemes, is so alarming as to justify us in putting down all manner of schemes, as far as lies in our power? Let it only be remembered, that every thing valuable in civilized life is the fruit of schemes; that all we enjoy above the lot of savages, comes from arts that were once mere projects: and we shall not be disposed to condemn, in one sweeping sentence, every innovation. This is in truth to denounce, as rash and ill-grounded, (we use the author's forcible illustration,) all those projects by which our species has been successively advanced, from feeding upon acorns, and covering themselves with raw hides, to the state in which it at present stands. Whatever (as he says) is now *the routine* of trade, was, at its commencement, *project;* whatever is now *establishment*, was at one time *innovation.*—And why such fears, after all, of our being impoverished by failing schemes? Long before the existence of the usury laws, the prosperity of our race was running on in an accelerating course;—long before the statutes in this country, its wealth and general improvement was rapidly and constantly advancing. There were every now and then failures, and individual losses in consequence; still their proportion to the bulk of successful projects was trifling; and no one can maintain, that, since the restraints were imposed, the proportion has diminished. Were the law silent on this head, money would still be lent to projectors, by those most deeply interested in the prudent disposal of it. We may safely trust their discretion for its being kept out of desperate risks. No one, indeed, has ridiculed the over-anxiety of such regulations as pretend to save men's capital from injudicious application, more happily than Dr. Smith himself. It is the great text, of which his immortal work is the illustration, almost in all its pages; and in no passage is he more severe, than where he reprobates the intermeddling of government to prevent private imprudence. After remarking, that the number of prudent and successful undertakings is every where much greater than that of injudicious and unsuccessful ones; he administers the following memorable correction to rulers for their love of meddling, and we may observe, that it is quite as well merited by the promoters of the usury laws, as by any other class of legislators. "It is the highest impertinence and presumption, therefore, in kings and ministers *to pretend to watch over the economy of private people*, and to restrain their expence, either by sumptuary laws, or by prohibiting the importation of foreign luxuries. They are themselves always, and without exception, the greatest spendthrifts in the society. Let them look well after their own expence, and they

they may safely trust private people with theirs. If their own extravagance does not ruin the state, that of their subjects never will."

However presumptuous and impertinent it may be, says Mr. Bentham, for the sovereign to attempt in any way to check by legal restraints the *prodigality* of individuals; to attempt to check their *bad management* by such restraints, seems abundantly more so. To err in the way of prodigality is the lot, though, as you well observe, not of *many* men, in comparison of the whole mass of mankind, yet at least of *any* man: the stuff fit to make a prodigal of is to be found in every alehouse, and under every hedge. But even to *err* in the way of projecting is the lot only of the privileged few. Prodigality, though not so common as to make any very material drain from the general mass of wealth, is however too common to be regarded as a mark of distinction, or as a singularity. But the stepping aside from any of the beaten paths of traffic, is regarded as a singularity, as serving to distinguish a man from other men. Even where it requires no genius, no peculiarity of talent, as where t consists in nothing more than the finding out a new market to buy or sell in, it requires however at least a degree of courage, which is not to be found in the common herd of men. What shall we say of it, where, in addition to the vulgar quality of courage, it requires the rare endowment of genius, as in the instance of all those successive enterprizes by which arts and manufactures have been brought from their original nothing to their present splendour? Think how small a part of the community these must make, in comparison of the race of prodigals; of that very race, which, were it only on account of the smallness of its number, would appear too inconsiderable to you to deserve attention. Yet prodigality is essentially and necessarily hurtful, as far as it goes, to the opulence of the state: projecting, only by accident. Every prodigal, without exception, impairs, by the very supposition impairs, if he does not annihilate, his fortune. But it certainly is not every projector that impairs his: it is not every projector that would have done so, had there been none of those wise laws to hinder him: for the fabric of national opulence—that fabric of which you proclaim, with so generous an exultation, the continual increase—that fabric, in every apartment of which, innumerable as they are, it required the reprobated hand of a projector to lay the first stone, has required some hands at least to be employed, and successfully employed. When, in comparison of the number of prodigals, which is too inconsiderable to deserve notice, the number of projectors of all kinds is so much more inconsiderable—and when from this inconsiderable number must be deducted, the not inconsiderable proportion of successful projectors—and from this remainder again, all those who can carry on their projects without need of borrowing—think whether it be possible, that this last remainder could afford a multitude, the reducing of which would be an object deserving the interposition of government by its magnitude, even taking for granted that it were an object proper in its nature?

But we forbear, and proceed with the same admirable writer, to state the mischiefs which the usury laws create in all directions. The most obvious mischief is, the depriving many persons altogether of the loans of which they stand in need. A person having the means of supplying himself with money, and being also pressed by necessity, is precluded from all chance of obtaining it, unless he has still further means of meeting his wants by evading, at an additional cost, the laws in question. Had it not been for these laws, such a person might have relieved his wants with ease: and he is one of those who have the greatest occasion for assistance, and the best claims to it. Since, by the supposition, they cannot do without the loan, and are both able and willing to pay the extraordinary rate of interest.

The next mischief is that which the law of usury inflicts upon those who have the means of giving, not only such an extraordinary rate of interest as the lenders, but for the restrictions, would be satisfied with, but somewhat more. These are not excluded altogether from the money market, like the former class; but the terms of the bargain are raised to them. Suppose they have nothing to sell, by which they can raise the money they want, then they must pay for the breach of the law, and this in two ways, both by giving a sufficient premium to the lender to make him run the extraordinary risk, and because the illegality of the trade keeps many dealers out of it, and by narrowing the competition, raises the profits. In the course of the last twenty years, a great trade has been driven in annuities, which admirably illustrates the operation of these laws, this being a perfectly legal mode of evading them, and yet one attended with ruinous expence to the borrower. The law has imposed a number of regulations upon such transactions, with the view of preventing them from becoming too easy a means of evading the usury laws. Those regulations increasing the risk of the lender, somewhat raise the price to the borrower. Then the nature of the transaction renders an insurance necessary upon the life of the borrower; and this is a large increase of price. Moreover, the number of lenders at usurious interest in the illegal way being narrowed by the competition, as all who are driven from this traffic do not necessarily resort to the line of annuities, the market is, notwithstanding the legal method of evasion, considerably narrowed. It has thus happened, that persons with excellent security, and who could easily have gotten loans at six and a half or seven *per cent.* but for the law, are obliged to pay eight or nine, besides the insurance, or from ten to twelve in all; and this, not to private money-lenders, who exact much more, but to the great insurance-companies, who have fallen upon this way of employing their superfluous capital, tempted by the double gains of lenders and insurers.

Moreover, suppose now, that the laws have prevented a man from borrowing at seven *per cent.*, and that he has still goods which he can part with to raise the money. But for the law he might keep his goods; and nothing can prevent his selling them at an under price, according to his necessities. No one who has known any thing of sales made in distressed circumstances, will think a loss of thirty *per cent.* very extraordinary in such cases. To such a loss as this, the most exorbitant usury bears no proportion; yet this is exactly the premium which the distressed man is compelled to pay for money, by the law which says he shall not borrow at the rate of five and a half. The pressure upon proprietors of real estates is still more severe. Suppose a man comes into possession of an estate worth two hundred a-year, charged with a thousand pounds; and that the incumbrancer wishes to have his money rather than the legal interest, but would be satisfied with one or two *per cent.* above that rate;—at any rate, if he would not, some other certainly could be found to advance the money at that premium, upon the same security.

The last mischief occasioned by the usury laws is, perhaps, more important than all the rest; *viz.* the corrupting influence upon the morals of the people, by the pains they take, and, as Mr. Bentham observes, cannot but take, to give birth to treachery and ingratitude.

"To

"To purchase," says the author, "a possibility of being enforced, the law neither has found, nor, what is very material, must it ever hope to find, in this case, any other expedient, than that of hiring a man to break his engagement, and to crush the hand that has been reached out to help him. In the case of informers in general, there has been no truth plighted, nor benefit received. In the case of real criminals invited by rewards to inform against accomplices, it is by such *breach* of faith that society is held together, as in other cases by the *observance* of it. In the case of real crimes, in proportion as their mischievousness is apparent, what cannot but be manifest even to the criminal is, that it is by the adherence to his engagement that he would do an injury to society, and, that by the breach of such engagement, instead of doing mischief he is doing good. In the case of usury this is what no man can know, and what one can scarcely think it possible for any man, who, in the character of the borrower, has been concerned in such a transaction, to imagine. He knew that, even in his own judgment, the engagement was a beneficial one to himself, or he would not have entered into it: and nobody else but the lender is affected by it."

It has been further alleged, that the laws against usury allow of transactions substantially usurious; and, indeed, that they cannot prevent these, without wholly putting a stop to the course of trade. Some of the most ordinary occurrences in commerce, are in their nature usury. The practice of drawing and redrawing, by which merchants are accommodated with money for a short time, at a certain commission over and above the five *per cent.*, and then for as much longer, until they pay ten, twelve, and more *per cent.* during the whole year, is only a more cumbrous and expensive method of borrowing above the legal rate of interest. But other well-known lines of traffic, though apparently more remote from usury, are not less closely connected with it: — pawn-broking, bottomry, and respondentia, will immediately occur to the reader. Nay, insurance in all its branches, and the purchase and sale of *post-obits*, with all cases in which a man is allowed to undertake an unlimited risk for an unlimited premium, are in their principle usurious transactions. Of these, the most notorious is the traffic in annuities; which, accordingly, has been found to be the easiest and safest mode of evading the usury laws, although we have already shewn how greatly it increases the rate of interest. For further particulars we must refer to the Treatise above cited; and also to the Edinburgh Review, N° liv.

USUS, in Roman Catholic times, was a term for the particular manner of performing the cathedral service; as almost every diocese had its own plain-chant, or at least differed in performing some parts of the mass from the rest. The *Use of Salisbury, Secundum usum Sarum*, was the most general.

USWAY, in *Geography*, a river of Northumberland, which runs into the Coquet.

USZCZA, a town of Poland; 25 miles E. of Cracow.

USZITERNA, a town of European Turkey, in the province of Servia; 25 miles S. of Jenibasar.

USZOMER, a town of Russian Poland, in Volhynia; 70 miles N.W. of Kiev.

USZTAN-UTAR, a town of Charasm; 250 miles N. of Urkonje.

UT, a Latin term, signifying, literally, *as*; much used in the stating of ratios and proportions.

Sir Isaac Newton assigns its use thus: if indeterminate quantities of divers kinds be compared together, and one of them be said to be *ut*, *as*, any other, directly, or inversely; the meaning is, that the first is increased, or diminished, in the same ratio as the latter. And if one of them be said to be, *ut*, *as*, two or more others, directly, or inversely; the meaning is, that the first is increased, or diminished, in a ratio compounded of the ratios in which the others are increased or diminished.

Thus if A be said to be *as* B directly, and *as* C directly, and *as* D inversely; the meaning is, it is increased, or diminished, in the same ratio with $B \times C \times \frac{1}{D}$; that is, A and $\frac{BC}{D}$ are to each other in a given ratio.

UT, the name of the first sound in each of the hexachords of Guido. By transpositions, *ut* (or *do*) is the key-note in solmisation of all major keys, and the mediant or 3d in minor keys.

This note, with the rest, were taken out of the hymn of St. John the Baptist, composed about the year 770, in the time of Charlemagne, according to Possevin, by Paulus Diaconus of Aquileia. *Ut queant laxis*, &c. See MUSIC.

UTAJARVI, in *Geography*, a town of Sweden, in the government of Ulea; 28 miles S.E. of Ulea.

UTAMANIA, in *Ornithology*, the name of a bird of the web-footed kind, wanting the hinder-toe. It is common about the island of Crete, and is very expert at diving. It is of the size of a teal, and has its head and back black, and its belly white. Its feathers resemble down rather than plumage; but though they are soft and slender, they are very firmly affixed to the skin. Its beak is sharp at the edges, and covered in a great part with down. From the description of Bellonius, as well as his figure, this bird approaches to the common razor-bill, if it is indeed essentially different from it.

UTAS, OCTAVA, in our *Statutes*, the eighth day following any feast or term, as the *utas of St. Michael*, &c. And any day between the feast and the octave is said to be within the utas. The use of this is in the return of writs, as appears by stat. 51 Hen. III.

UTAWAS, or UTWAS, in *Geography*, a river of Canada, which joins the St. Lawrence, near lake St. Francis.

UTENDORF, a town of the county of Henneberg; 4 miles N.E. of Meinungen.

UTENSIL, UTENSILE, a little domestic moveable, particularly such as belong to the kitchen. Such as pots, pans, plates, &c.

UTENSILS are more particularly used in war, for the moveables which the host is obliged to furnish the soldiers quartered with him; which are a bed with bed-cloaths, a pot, and a spoon. They are likewise to have a place at their host's fire, and candle. Utensils are sometimes furnished in money, and sometimes in kind.

UTERINE, in *Anatomy*, an epithet applied to various parts belonging to the uterus; as its arteries, veins, &c. The uterine portion of the placenta is the part immediately adhering to the uterus. See EMBRYO, and GENERATION.

UTERINE, *Fœtus extra*. It sometimes happens that the fecundated or impregnated ovum, instead of falling from its calyx into the fimbriated end of the corresponding Fallopian tube, (see CONCEPTION,) and thence descending into the uterus, its natural nidus, either continues adherent to the ovarium, and is there nourished and increased; or, separating from the ovarium, and missing the mouth of the tube, falls into the cavity of the abdomen, and adhering to the mesentery, or some of the bowels, absorbs and takes its nourishment from thence; or, lastly, having entered one of the Fallopian tubes, and not able, from the straightness of the passage, to pass on to the uterus, it is there detained and nourished.

nouriſhed. In this caſe, it frequently happens that after the ovum has attained the ſize of a hen's or a gooſe's egg, the ſides of the tube (not being able to bear further diſtenſion) burſt, and hæmorrhage from the ruptured veſſels enſuing, the woman dies. De Graaf and Santorinus have each of them related a caſe of this kind that fell under their notice (ſee Obſ. Anatom. J. D. Santorini, 4to. p. 225.), and have given engravings, repreſenting the appearance of the parts on diſſection. In which it is remarkable, that though the fœtus, in neither caſe, had reached the uterus, yet that viſcus had increaſed, and its cavity was diſtended, nearly to the ſame ſize it would have been if the fœtus had been there. But when the ovum is not reſtricted in its growth by the ſtraightneſs of the place where it happens to be depoſited, or is not blighted and deſtroyed by any other cauſe, it continues increaſing, and the incloſed fœtus grows, and attains nearly the ſame ſize it would have done if it had been lodged in the uterus, and at the end of nine months, the uſual term of geſtation, the woman has pains ſimilar to thoſe of labour; but as there is no opening by which the fœtus can be excluded after ſhe has been tormented with pains for ſome days, they ceaſe, and the child dies. If the cyſt or bag in which the ovum is contained happens to be placed in a part not very ſuſceptible of pain, it may remain in a quieſcent ſtate many weeks, months, or even years, without occaſioning much diſturbance to the woman, and the fœtus, with its involucra, attain a cartilaginous conſiſtence. It more frequently happens, however, that the fœtus becoming putrid ſoon after death, and the fleſh diſſolving, the now denuded bones, preſſing againſt the cyſt, excite inflammation and pain in the parts of the woman to which it is contiguous, which at length ſuppurating, or ſloughing away, an opening is made either externally, through the muſcles and teguments of the abdomen, or internally, through the coats of the bowels, and the bones of the fœtus are either voided with the ſtools, or through the abſceſs in the abdomen. Women after theſe diſtreſſing circumſtances, during which their ſufferings have been extreme, not unfrequently recover a good ſtate of health, and live many years.

In theſe caſes, though art can do but little, yet ſome aſſiſtance may be occaſionally given. When the cyſt has opened internally into the bowels, after the diſcharge of the putrid colluvies, into which the ſoft parts of the child has been diſſolved, the bones begin to come away; and if one of them ſhould lie acroſs the rectum, occaſioning violent ſtrainings and pain, by paſſing a finger into the gut, the poſition of the bone may be altered, and its exit promoted. The paſſage of the bones may alſo be facilitated, and the pain occaſioned by them alleviated, by injecting emollient glyſters, to which it may be ſometimes uſeful to add thirty or forty drops of the tincture of opium. When the abſceſs is external, its ſuppuration may be promoted by poultices, or the aperture, after it has burſt, may be enlarged with a lancet or knife, and the bones taken out with a pair of forceps. When the fœtus makes its exit through the bowels or vagina, it may ſometimes be many weeks, months, or even years, before the bones are completely evacuated; but when the opening is external, through the parietes of the abdomen, the whole proceſs is uſually over, and the abſceſs healed in the ſpace of a few weeks.

Ordinarily there are no ſymptoms, in the early months of pregnancy particularly, by which we may ſuſpect the fœtus not to be in the uterus. The menſes ceaſe, and there is the ſame nauſea, ſickneſs, and fullneſs of the breaſts, as in natural conception or pregnancy. The uterus increaſes in bulk, and its cavity enlarges, though not to the ſame extent as when the fœtus is included. At the end of the period of geſtation, pains are excited ſo like to thoſe in a natural labour, as to deceive for a time even experienced practitioners.

Many caſes of this kind have been recorded by medical writers, beſides thoſe mentioned by De Graaf and Santorinus. The following account of a fœtus of ſix months, which was voided entire by the anus, is taken from Mr. William Giffard's Collection of Caſes in Midwifery, N° 157, publiſhed by Dr. Edward Hody, in 4to. 1734. The woman died a few days after the excluſion of the fœtus, and was opened by Mr. Giffard, aſſiſted by Mr. Nourſe, one of the ſurgeons to Bartholomew's hoſpital, in the preſence of Dr. Dodd, phyſician to the ſame hoſpital. The parts were exhibited to the Royal Society, and drawings of them taken, under the direction of ſir Hans Sloane, the preſident. From them two engravings were executed, which are publiſhed with the volume.

The ovum appears not to have completely left the ovarium, which, with the fimbriated end of the Fallopian tube, and the ligamentum latum of the right ſide, appear to be confuſedly joined together, and each of them contributing towards forming the ſacculus, or bag, containing the ovum. The fœtus had been perfect, but was beginning to be putrid. It was of the ſize fœtuſes uſually are at ſix months. It is not delineated. The woman had the uſual ſigns of breeding, and at the proper time felt the motion of the child, which increaſing, and by its weight ſinking down behind the uterus, and dragging the fundus of that viſcus with it, at length, by its preſſure on the rectum, occaſioned inflammation, and a portion of the rectum, and of the bag ſloughing off, the fœtus fell into the gut, and was voided by the anus.

The uterus was not examined, but it appears by the drawing to have been of a larger ſize than it is uſually ſeen to be in women who are not pregnant, and if it had been opened, the cavity would doubtleſs have been found proportionably increaſed.

De Graaf, in his work "De Organis Mulierum," p. 252. tab. 21, has given a delineation of an ovum that was detained in one of the Fallopian tubes, from Veſalius, who diſſected the body of the woman. The embryo was between three and four months old, when the ſides of the tube giving way, the woman died. Veſalius thought the cavity in which the ovum had been retained was a ſecond uterus.

Ciprianus, in a letter to Dr. Millington, preſident of the college of phyſicians, London, has given the caſe of an extraordinary fœtus that had continued in the abdomen of its mother twenty-one months. He extracted it by enlarging the opening of an impoſthume that had broken naturally. The letter is dated Leyden, 1707.

Strauſius gives an account of a woman, aged ſixty-three years, who died in conſequence of a fall. She had, for twenty years previous to her death, complained of a pain and ſwelling in the middle and lower part of the abdomen. On opening the body, a fœtus was found perfectly formed, but of the hardneſs of ſtone. "Cutiſerat ſaxi in modum dura," he ſays, "Caput erat malleo frangendum, &c." Laur. Strauſii Reſolutio caſus Muſſipantani fœtus extra uterum, &c." p. 39.

UTERINE *Hæmorrhages*. See FLOODING.

In this dangerous diſorder the ſtyptic powder of Helvetius is much recommended: and the ſtibium ceratum has alſo been tried with great ſucceſs. See VITRUM *antimonii ceratum*.

In the Stockholm Acts, 1770, there are ſeveral caſes of uterine hæmorrhages cured by a third or half a grain of ipecacuanha, rubbed with ſugar, given every four hours or oftener.

oftener. In one cafe, the hæmorrhage returned on difcontinuing the medicine, and ceafed on repeating it. Thefe fmall dofes had good effects in catarrhal coughs, even in thofe which attend confumptions; and if not beneficial, are at leaft not hurtful, in bloody coughs, in which vomiting has feveral times been obferved to come on, without any increafe of the hæmorrhage. They may be ufeful in peripneumony and pleurify, in which cough is often the moft troublefome fymptom, and in which feneka root (which in increafed dofes proves alfo emetic) has been fo much recommended.

UTERINE *Brothers* or *Sifters* are thofe born of the fame mother, but by different fathers.

UTERINUM JECUR. See JECUR.

UTERINUS, FUROR, in *Medicine*. See FUROR.

Men are fubject to the like difeafe, as well as women; fo that it might with more propriety be called, the *furor venereus*, or venereal fury. It had its name, *furor uterinus*, from an opinion, that it proceeded from vapours, rifing from the womb to the brain.

It has been frequently found, that maids, fuppofed to be poffeffed, were only feized with uterine fury.

UTERINUS *Lapis*, in *Natural Hiftory*, a name given by fome authors to a ftone found in New Spain, and in fome other parts of America; it is very hard and heavy, of a beautiful black, and capable of a very elegant polifh. The natives cut it into various fhapes, and apply it to the navel in difeafes of the womb, and pretend that it poffeffes very great virtues.

UTERUS, in *Anatomy*, the womb, the organ in which the embryo is received from the ovarium, to which it becomes adherent fo as to receive the materials of its growth, and in which it is retained for a longer or fhorter time in various fpecies, until its expulfion in the procefs of parturition. A proper uterus belongs only to the mammalia; oviparous generation, under various modifications, is found in the other claffes, and the female organ is therefore reduced to a mere canal (oviduct) for the tranfmiffion of the ova. See GENERATION. See alfo CONCEPTION, GESTATION, and EMBRYO.

UTERUS, *Inverfion of*. Sometimes the uterus defcends through the os tincæ into the vagina, and occafionally quite out of the vulva. The firft cafe is termed the *incomplete;* the fecond, the *complete* inverfio uteri. In the latter, the vagina is alfo drawn downward, and inverted, fo that the whole tumour, fituated before the parts of generation, feems to hang by a pedicle, compofed of the inverted vagina. Between this pedicle and the labia, there is no interfpace which will admit a probe. The outer furface of the tumour is, in fact, the lining of the uterus itfelf.

It being obvious, that the fundus uteri cannot defcend through the os tincæ, unlefs this aperture be confiderably dilated, it follows, that an inverfio uteri can only happen juft after delivery; and one common caufe of the accident is, the unfkilful employment of force in the extraction of the placenta. Polypi, growing from the fundus uteri, however, are particular cafes, in which the inverfion of this organ may take place from its being drawn downwards by the weight of fuch tumours.

Great pain, inflammation, tumefaction, and hæmorrhage, are the ufual confequences of an inverfion of the uterus. Even mortification, convulfions, and death may refult from the complete form of the difeafe, efpecially when it has occurred in a very fudden manner.

The reduction of an inverted uterus ought to be attempted without the leaft delay. The longer the operation is deferred, the more difficult it becomes; for, in thefe cafes, pain, inflammation, and fwelling, generally come on with great rapidity. If inflammation fhould already prevail, there are fome practitioners, who think it beft to apply leeches and fomentations to the fwelling, before undertaking its reduction. It is certain, however, that very little time fhould be allotted to any proceedings, before endeavouring to reduce the part, which can hardly be kept from inflaming more and more, the longer it remains out of its natural fituation. Leeches, fomentations, and even venefection, muft, however, be highly proper, whenever the firft attempts at reduction do not immediately fucceed.

In very old cafes, in which the fundus uteri has fuffered long compreffion in the vagina, fuch an alteration takes place in the fhape and ftructure of the uterus, that the inverfion is totally incurable; and all that can then be done is to reftrain its further defcent by means of a peffary.

The uterus, befides being inverted, may alfo be in a fcirrhous, or actually cancerous ftate. In this circumftance, the propriety of amputating the difeafed organ has been eftablifhed by feveral precedents recorded in the annals of furgery. Yet the prudence and utility of this operation muft very much depend upon, whether the uterus is the only part affected with the difeafe; whether the lymphatic glands in the groin and within the abdomen are found; and whether the general ftate of the patient is fuch as to juftify a rational hope of recovery.

UTERUS, *Polypi of*. See POLYPUS.

UTERUS, *Procidentia* or *Prolapfus of*. See PROLAPSUS *Uteri*.

UTERUS, *Retroverfion of*. See RETROVERSIO *Uteri*.

UTERUS, *Rupture of*. This accident may happen in any kind of labour; the caufe of it is probably the uterus being thinner and weaker in fome part than is ufual, particularly near to its union with the vagina, that being found to be the moft common feat of the accident. That it is not occafioned by any peculiar difeafe of the uterus, is probable, as there are no fymptoms occurring during pregnancy from which we might judge it to be likely to happen, but in the courfe of the labour, an hour or two before the accident takes place, the women complain of an exceedingly acute pain in fome part of their bellies. At the moment of the rupture, they feel that fomething has given way within them. The labour-pains ceafe; and, if the head of the child has not paffed the veins of the pelvis, it recedes, and gradually gets out of the reach of the fingers. Vomiting, palenefs of the face, fighing, and a cold fweat, fhewing the magnitude of the difafter, fucceed. The pulfe becomes weak, quick, and fcarcely perceptible; and at the end of twenty-four, thirty-fix, or forty-eight hours the woman dies.

If the perfon attending is competent to the bufinefs, it is right to follow the child with his hand through the rent in the uterus, into the abdomen, and to bring it away by its feet. This is not done fo much with a view to preferve the life of the woman, who almoft inevitably perifhes, as to fave the child, which, if the operation is immediately performed, may often be done. The late Dr. Andrew Douglas relates the hiftory of one cafe in which the woman was alfo faved. It is the only cafe of the kind on record, or perhaps that ever occurred. To give the woman this chance, the operation muft be performed immediately, for as the uterus is found fpeedily to contract, and diminifh the aperture, to attempt it after that has taken place, would be to reopen the wound, to renew the hæmorrhage, and confequently to haften the death of the woman.

UTERUS *of fifh*. Among the fifh kinds, all thofe which are

are oviparous have no uterus; but, on the contrary, all the viviparous fishes have this part. The whales, and all the cetaceous kinds, as also many of the cartilaginous ones, have the uterus very fair. It is probable that the eel kind also have it; but this is less certain, the generation of those fishes being yet somewhat obscure. The uterus in the cetaceous fishes is always divided into two processes or horns; but in the cartilaginous ones it is divided into two glandulous bodies, which are pervious, and, according to the opinion of Needham, discharge a whitish liquor into the womb, and are of great use in gravidation.

Uteri, *cornua*, are also called horns of the womb.

Uteri, *hydrops*. See Dropsy.

Uteri, *vagina*, or *cervix*. See those articles.

UTFANGTHEF, in our *Law-Books*. See Outfangthefe.

UTHINA, in *Ancient Geography*, a town of the interior of Africa Propria, between Tabraca and the river Bagrada. It had the title of a colony.

UTHISIA, a town of Africa, in Numidia.

UTHLEDE, in *Geography*, a town of the duchy of Bremen; 23 miles N.N.W. of Bremen.

UTICA, (*Booshatter*,) in *Ancient Geography*, a maritime town of Africa, between Carthage and the promontory of Apollo. It was a colony of Tyrians, and named by the Greeks Ιτυκη, Itica. This town, by its magnitude and dignity, was inferior only to Carthage; and after the destruction of this city, it became the capital of the province. According to Strabo, it was situated upon the same gulf with Carthage. Augustus granted the title of Roman citizens to its inhabitants. It is often mentioned in the history of the civil war of Cæsar; and it became still more famous by the death of Cato. On its scite are found old walls, a very large aqueduct, cisterns, and other vestiges of edifices, which announce a large and magnificent city. To the S.W. of these ruins may be seen spacious fields, which the Romans rendered famous by their military exercises. Booshatter, by the accumulation of mud brought down by the river Bagrada, is now about 7 miles from the sea.

Utica, in *Geography*, a flourishing incorporated post-village of New York, the commercial capital of the great western district of this state, situated on the S. bank of the Mohawk, 93 miles W. of Albany, in the town of Whitestown, Oneida county. It stands on the scite of Old Fort Schuyler, 13 miles N.E. of Rome, anciently Fort Stanwix, and is handsomely laid out in streets, squares, &c., and was incorporated as a village in 1798, and again in 1805. Although Utica is small in area, it contains a population of 1700 persons, and has 300 houses and stores, a Presbyterian and an Episcopal church, a grammar-school, &c. Besides these buildings it has many others, with mills, factories, shops of mechanics, printing-offices, and large book-stores. Weekly papers are published here, and widely circulated through the surrounding country. The Manhattan bank has established a bank at Utica, and in 1812 it obtained a charter for a bank, with a capital of one million of dollars. The soil is fertile, and the situation healthy and pleasant. This village is the central point for all the principal avenues of communication by common roads and turnpikes, and forms the key of trade and travel between the western country and Atlantic ports and towns. N. lat. 43° 6′. W. long. 1° 12′ from New York.

UTICNA, in *Ancient Geography*, a town of Africa Propria, situated to the S. of Adrumetum.

UTIDAVA, a town of Dacia. Ptolemy.

UTIDORSI, a people of Asiatic Scythia, upon the coast of the Caspian sea, towards the river Cyrus. Pliny.

UTIEL, in *Geography*, a town of Spain, in New Castile; 48 miles S.E. of Cuença.

UTII, in *Ancient Geography*, a people who were Persians, or subjects or allies of the Persians. They had for their commandant, in conjunction with the Myci, Arsamenes, son of Darius, according to Herodotus. From various circumstances, it has been inferred that the Outians or Utians of Herodotus are the Uxians of Strabo and Ptolemy.

UTIKON, or Oetikon, in *Geography*, a town of Switzerland, in the canton of Zurich; 12 miles N.E. of Zurich.

UTILA, an island in the gulf of Honduras, about 30 miles from the coast; about 15 miles long, and 5 broad. N. lat. 16° 4′. W. long. 87° 45′.

UTILE, a Latin term, signifying probable, or useful; sometimes used, by English authors, in the same sense.

The *utile* and the *dulce*, profit and delight, are both to be aimed at in poetry; but it is disputed, which of them is to be aimed at in the first place. Corneille says, expressly, "Dans la tragedie l'utile n'entre que sous la forme du delectable."

In the language of the philosophers, there is nothing *utile*, but what is just and honest: *nihil bonum, nisi honestum: nihil malum, nisi turpe*. Cic. de Fin. lib. ii.

Utile *Dominium*. See Dominium.

UTILITY, in *Moral Philosophy*, is the tendency of any action to promote the general happiness. According to archdeacon Paley, actions are to be estimated by their tendency. Whatever is expedient is right: and it is the utility of any moral rule alone which constitutes the obligation of it, and this is the criterion of right. On this subject, see Obligation, *Moral* Philosophy, and Virtue.

UTILLO, in *Geography*, a town of the island of Cuba; 50 miles S.S.E. of Havanna.

UTINA, in *Ancient Geography*, a town of ancient Venetia, now Ondina.

UTIS, a river of Italy, or rather of Gallia Cisalpina.

UTKINSKAIA, or Utkinskoi, in *Geography*, a town of Russia, in the province of Ekaterinburg, on the Tchusovaia; 36 miles N.W. of Ekaterinburg.

UTLAGARIÆ Perdonatio. See Perdonatio.

UTLAGATIO, in *Law*, an outlawry.

UTLAGATO *capiendo, quando utlagatur in uno comitatu, & postea fugit in alium*, a writ for apprehending a man who is outlawed in one county, and flies into another. See Outlawry.

UTLAGATUM Capias. See Capias.

UTLAGH, Utlaghus. See Outlaw.

UTLAND, *Outland*, is opposed to *Inland*.

UTLARY, or Utlawry, Utlagaria. See Outlawry.

UTNEMSKOI, in *Geography*, a town of Russia, in the province of Ustiug, on the Vitchegda. N. lat. 62° 56′. E. long. 54° 14′.

UTON, an island near the east coast of Sweden, in the Baltic. N. lat. 58° 57′. E. long. 18° 5′.

UTPHA, a town of Germany, in the principality of Solms Laubach, on the Horlof; 2 miles S.W. of Hungen.

UTRACH, a town of Austria; 7 miles N. of St. Wolfgang.

UTRAQUISTÆ, in *Church History*, an appellation given by way of reproach to those in Bohemia who communicate under both species, bread and wine.

UTRECHT, in *Geography*, a department of Holland, late one of the Dutch States, which, excepting in one small

ſmall ſtrip of land to the northward, and bordering on the Zuyder See, is wholly environed by Holland and Guelderland: it enjoys a good air, and in moſt parts the ſoil is very fruitful; to the eaſtward it is indeed a high and ſterile country, conſiſting either of ſandy hills or ſmall eminences, which are in general over-run with wood; and weſtward the country perfectly reſembles Holland, being for the moſt part rich meadow, though in many parts full of turf grounds.

Utrecht, a city of Holland, and capital of the ſtate or department ſo called; in Latin, *Ultrajectum, Trajectum Inferius, Trajectum Utricenſium, Antonina Civitas*, which laſt name was given it from Antoninus, a Roman ſenator, by whom it was built, in the time of Nero; and *Trajectum ad Rhenum*, to diſtinguiſh it from Maeſtricht, which was called *Trajectum ad Moſam*. It is a handſome, large, and rich city, ſituated on the ancient Rhine. The Wiltes ruined it, and left nothing but the caſtle, which they called *Wiltenbourg*. In the year 718, Clotaire king of France rebuilt it, and firſt called it Utrecht, from the word *Trecht*, which ſignifies paſſage, becauſe it was the grand paſſage over the Rhine, before that river had changed its bed. It was enlarged, and ſurrounded with walls, about the year 934, by Balderic de Cleves, the fifteenth biſhop. Its figure is oval, and it is about four miles in circumference, beſides four large fauxbourgs; but though fortified with ſome baſtions and half-moons, it is not ſtrong. The emperor Charles V. when he became maſter of the ſigniory and city of Utrecht, in the year 1529, built a château, which he called *Vrebourg*, or the *Château of Peace;* and in the year 1546, celebrated a chapter of the order of the Golden Fleece in the cathedral church, when Maximilian king of Bohemia, and afterwards emperor, Coſmo duke of Florence, Albert duke of Bavaria, Emanuel Philibert duke of Savoy, and eighteen other lords, were inſtalled knights. The dôme, or the cathedral church, it is ſaid, was firſt built in the year 630, by king Dagobert I., and St. Willebrord made it an abbey church, and ſoon after it became a cathedral. The height of the tower is 380 feet, and from the top in a clear day fifteen or ſixteen cities may be ſeen. The cathedral was at firſt dedicated to St. Thomas, afterwards to St. Martin. The church of Notre-Dâme, commonly called *Buur-Kerch*, and Engliſh church, has a ſmall library, which contains ſome ancient manuſcripts; the other pariſhes are St. James, St. Nicholas, and St. Gertrude. It has likewiſe hoſpitals for orphans, foundlings, &c. Before the Reformation, it had many religious houſes. The magiſtracy is compoſed of a grand bailly, two burgomaſters, twelve echevins, a treaſurer, an intendant of buildings, a preſident, three commiſſioners of finances, and a ſenator, which are changed every year on the 12th of October, and aſſemble in the town-houſe, which is a handſome ſtructure. The principal ſtreets are cut through with canals, two of which run through the whole city, namely, the Vaert, and the new Gracht, over which there are thirty-five bridges. Theſe are the principal canals of the town, and the buildings on the banks of the new Gracht are magnificent. The market-place is very large, and the centre of ſeveral handſome ſtreets. The houſes are of brick, and many of them ſtately; they have in general good cellars, which they cannot have in the ſtate of Holland, the ground there being too marſhy. Without the town there are beautiful rows of trees, to which the Engliſh have given the name of the Mall, by reaſon of their having ſome reſemblance to St. James's Park. This place was the ſeat of an archbiſhop, before it fell into the Proteſtants' hands, and had four collegiate churches, two commanderies, and ſeveral abbeys, which have been all ſecularized by the States, and applied to other uſes. As it ſtands in a very healthful air, it is frequented by perſons of diſtinction, who have very fine houſes in this city. The univerſity, which has been very famous, was originally only a public ſchool, founded by David of Burgundy, biſhop of Utrecht; but in the year 1636, it was converted into an univerſity by the States. The univerſity is ſubject to the magiſtrates of the city, and has not many privileges. The ſtudents wear their ordinary dreſs, and board in private houſes in the town, for there are ſcarcely any endowed colleges in Holland. Here the ſtates of the province aſſemble to take cognizance of the affairs of the whole province. There is a public library, well ſtocked with books in all branches of learning. The town is famous for the treaty of union, ſigned in 1579, between the Seven Provinces, which laid the foundation of the republic; as likewiſe for the treaty of peace, ſigned here in 1713, between France and the Grand Allies. Utrecht gave birth to pope Adrian VI., whoſe houſe they always ſhew to foreigners; and to the celebrated Ann Mary Schurman, ſo admired in the laſt century for her learning; 18 miles S.S.E. of Amſterdam. N. lat. 52° 6′. E. long. 5° 11′.

Utrecht, a townſhip of New York, in Long iſland.

UTRERA, a town of Spain, in the province of Seville. It contains two pariſhes, four hoſpitals, and eight convents; near it is a ſalt ſpring; 21 miles S. of Seville.

UTRICULARIA, in *Botany*, ſo named by Linnæus, from the numerous little bladders, *utriculi*, which often accompany the leaves, and ſerve to float the plant.—Linn. Gen. 14. Schreb. 19. Willd. Sp. Pl. v. 1. 111. Mart. Mill. Dict. v. 4. Vahl Enum. v. 1. 194. Sm. Fl. Brit. 28. Prodr. Fl. Græc. Sibth. v. 1. 11. Brown Prodr. Nov. Holl. v. 1. 430. Purſh 15. Ait. Hort. Kew. v. 1. 45. Epit. 376. Juſſ. 98. Poiret in Lamarck Dict. v. 8. 267. Lamarck Illuſtr. t. 14.—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Corydales*, Linn. *Lyſimachiis affine*, Juſſ. *Lentibulariæ*, Richard and Brown.

Gen. Ch. *Cal.* Perianth inferior, of two equal, ovate, concave, ſmall, moſtly undivided, permanent leaves. *Cor.* of one petal, ringent: upper lip flat, obtuſe, erect: lower larger, flat, undivided; its palate heart-ſhaped, more or leſs prominent between the lips. Nectary a ſimple or double ſpur, protruding from the baſe of the petal behind. *Stam.* Filaments two, inſerted into the baſe of the corolla, very ſhort, incurved; anthers ſmall, cohering together. *Piſt.* Germen ſuperior, globoſe; ſtyle thread-ſhaped, the length of the calyx; ſtigma conical, ſometimes divided. *Peric.* Capſule large, globoſe, of one cell. *Seeds* numerous, ſmall, attached to a large globular *receptacle*.

Eſſ. Ch. Corolla ringent, ſpurred. Calyx of two equal leaves. Capſule ſuperior, of one cell.

A very curious and elegant genus, of herbaceous, ſtemleſs, aquatic or bog plants, found in various parts of the world, but perhaps more numerous in New Holland than in any other country. Linnæus in the 14th edition of his Syſt. Veg. has but nine ſpecies in all. Willdenow has eleven, Vahl thirty-four, Poiret thirty-ſix. Three are found in Britain; nine, according to Mr. Purſh, in North America. But Mr. Brown defines twenty-four *Utriculariæ*, natives of New Holland alone. Of theſe ſeveral were detected by ſir Joſeph Banks and Dr. Solander. We have heard the former of theſe eminent botaniſts relate, that almoſt every morning's walk afforded them a new *Utricularia;* but the delicate flowers were generally ſo frail and tranſient, or the diſtinctive characters of the ſpecies ſo difficult to de-

ſine, that ſeveral of theſe beautiful novelties were neceſſarily left undetermined. Any botaniſt poſſeſſed of an extenſive herbarium, cannot fail to acknowledge that he is reduced to the ſame neceſſity; for Vahl, who has given the beſt general account of the ſpecies of this genus, confeſſes that he had ſeen many more, that were undoubtedly diſtinct, but for which he could not hit upon ſpecific characters, ſuch being ſcarcely diſcernible in dried ſpecimens. None of theſe plants appear capable of cultivation, at leaſt none have as yet been introduced into gardens. Vahl diſtributes them into four ſections, which we ſhall adopt, with ſuch additions and corrections as we are enabled to attempt. Our kind friend Dr. Afzelius has ſupplied ſeveral apparently new ſpecies from Sierra Leone, which, as far as poſſible, we ſhall try to reduce to order. It is very probable, eſpecially as the whole genus is more or leſs aquatic, that the ſame ſpecies may occur in the old and new continent, or other widely diſtant countries. But as we find not a ſingle inſtance of this kind recorded, we ſhall not venture to refer any of our unknown ſpecies, from one quarter of the globe, to the deſcriptions of any found in another. The Guinea ſpecies, for inſtance, we muſt preſume to be all different from thoſe of New Holland, or of South America. The herbarium of the younger Linnæus contains perhaps eight ſpecies, without any indication of their native country, or any mark whatever. Theſe muſt of courſe be omitted, as they may poſſibly be New Holland ſpecies, communicated, like many other plants, to their late poſſeſſor, by his friend Solander; and it would be too precarious to refer them, by examination in their dried and imperfect condition, to any of Mr. Brown's deſcriptions, however excellent the latter may be with a reference to living plants. Vahl has a numerous ſection, fifteen ſpecies, ſaid to have no leaves. Such indeed is the frequent appearance of many of the plants, in the dried ſtate, in which alone he had an opportunity of examining them. But Mr. Brown, who ſaw ſo many alive, mentions none that are truly leafleſs, though he ſays the foliage is often deciduous in thoſe with undivided leaves. There is great likelihood, therefore, that ſeveral of Vahl's laſt ſection may properly belong to his firſt; as proves to be the caſe with his *uliginoſa*, aſſerted by Mr. Brown to be either *graminifolia*, or *cyanea*, he could not poſitively ſay which. For the reſt we can only truſt to his opinion or obſervation.

Sect. 1. *Leaves radical, ſimple.*

1. U. *alpina.* Alpine Bladderwort. Linn. Sp. Pl. 25. Willd. n. 1. Poiret n. 1. (U. montana; Jacq. Amer. 7. t. 6. "U. unifolia; Fl. Peruv. v. 1. 20. t. 30. f. b.")—Nectary awl-ſhaped. Stalk moſtly ſingle-flowered. Roots tuberous. Leaves elliptic-lanceolate. Lips of the corolla nearly equal.—Gathered by Jacquin, on the loftieſt mountains of the iſland of Martinico, in wet expoſed ſituations, flowering in February. *Root* fibrous, furniſhed with many ſmall elliptical knobs. *Leaves* two, radical, ſtalked, acute, entire, an inch and a half long, ſmooth, ſhining, rather fleſhy. *Flower-ſtalks* ſolitary, ſimple, erect, ſmooth, ſix inches high, bearing two oppoſite *bracteas*, and one, ſometimes two, large handſome *flowers*, above an inch in diameter, whoſe *corolla* is white, the *calyx* and *nectary* only being ſlightly tinged with yellow. *Jacquin.* This ſeems to have the largeſt *flower* of any known ſpecies, except the following.

2. U. *montana.* Mountain Bladderwort. Poiret n. 2.—Nectary conical, acute. Stalk naked, moſtly two-flowered. Roots verſicular. Leaves radical, ovato-lanceolate.—Native of Martinico. This might be ſuppoſed the ſame as the laſt, but Poiret ſays "the lower *leaves, or rather the roots*, are brown, conſiſting of numerous ſpreading fibres, a little compreſſed, laden with ſhort ſetaceous filaments, which bear a few minute globular veſicles. Radical *leaves* ſtalked, at leaſt an inch long, bluntiſh, ſmooth, fleſhy, entire, with fine branching veins. *Footſtalks* full as long as the leaves. *Flower-ſtalks* ſix or eight inches high, bearing ſeveral diſtant, minute, membranous, oval-oblong, ſcaly *bracteas*, and divided at the top into two widely ſpreading branches, each bearing one *flower*, an inch at leaſt in diameter, apparently white; with a tinge of blue. *Calyx-leaves* oval, obtuſe, very thin, broadeſt at the baſe, marked, like the *corolla*, with ſtraight longitudinal lines. The two lips of the latter are flat, very broad, nearly equal, rounded, almoſt entire. *Spur* rather ſhorter than the lips, awl-ſhaped, ſlightly curved."

3. U. *hiſpida.* Branched Rough Bladderwort. Lamarck Illuſtr. v. 1. 50. Vahl n. 2. Poiret n. 3.—"Nectary awl-ſhaped, reflexed. Stalk branched; hiſpid in the lower part. Leaves linear. Calyx-leaves roundiſh."—Found in Cayenne, by M. Richard. *Roots* faſciculated, ſubdivided, hardly an inch long. *Leaves* three, radical, an inch long, acute, ſmooth, without rib or veins, each tapering at the baſe into a footſtalk. *Flower-ſtalk* half a foot high, or more, round; ſmooth in the upper part, where it divides into two or three zigzag branches; *partial ſtalks* four or five, diſtant, ſingle-flowered. *Flowers* ſmall. *Nectary* nearly the length of the petal. *Vahl.*

4. U. *volubilis.* Twining Bladderwort. Brown n. 3.—"Stalk twining, round, about two-flowered. Lips of the corolla undivided; the upper wedge-ſhaped; lower very large, hatchet-ſhaped. Spur deſcending, obtuſe, depreſſed. Calyx obtuſe."—Gathered by Mr. Brown, on the ſouthern coaſt of New Holland.

5. U. *ſpiralis.* Spiral-ſtalked Bladderwort.—Stalk twining ſpirally, with ſeveral diſtant flowers. Lower lip very large, cloven. Spur deſcending, awl-ſhaped, pointed. Calyx acute.—Native of Sierra Leone. *Afzelius.* The *ſtalk* of our only ſpecimen is a foot or more in height, ſlender, ſmooth, unbranched, twining round the ſtem of a graſs, and bearing four *flowers*, two inches at leaſt aſunder, except the two uppermoſt. Each *flower* ſtands on a ſlender partial ſtalk, half an inch long, accompanied by two ſmall ovate *bracteas*. The *ſpur* is very ſharp, the length of the partial ſtalk, and rather longer than the lower *lip*. The colour of the *flowers*, as far as can be judged, is purpliſh. We have ſeen no *leaves* nor *root*, and therefore place this ſpecies here merely from the agreement of its *ſtem* with the laſt, of which we have but few examples.

6. U. *ſpecioſa.* Handſome Bladderwort. Brown n. 4. (U. dichotoma; Labillard. Nov. Holl. v. 1. 11. t. 8. Poiret n. 9.)—Stalk ſtraight. Flowers oppoſite. Upper lip abrupt; lower very large, hatchet-ſhaped, undivided. Spur obtuſe. Leaves linear-ſpatulate, ribbed; tapering at the baſe.—Native of New South Wales and Van Diemen's iſland. *Root* of many tufted fibres, bearing ſmall knobs. *Leaves* radical, ſpreading, above an inch long, immerſed in water, as well as half the *ſtalk*, which is twelve or fifteen inches high, quite ſmooth and naked till within three or four inches of the top, where it bears about three diſtant pairs of oppoſite, ſtalked, bracteated, large and handſome purple *flowers*; whoſe *palate* is bearded; *ſpur* thick and abrupt, half the length of the lower *lip*; one leaf of the *calyx* cloven.

7. U. *oppoſitiflora.* Oppoſite-flowered Bladderwort. Brown n. 5.—"Stalk ſtraight, round. Flowers oppoſite. Lips

Lips undivided; the lower very large, hatchet-ſhaped. Palate lobed. Spur obtuſe. Leaves ovate, obtuſe, ſtalked."—Gathered by Mr. Brown, near Port Jackſon, New South Wales. The *ſtalk* grows altogether out of the water.

8. U. *uniflora*. Single-flowered Bladderwort. Brown n. 6.—"Stalk ſtraight, round, ſingle-flowered. Leaves few, roundiſh, deciduous. Upper lip wedge-ſhaped, abrupt; lower very large, hatchet-ſhaped, undivided. Palate lobed. Spur obtuſe."—Native of the ſame country, and of Van Diemen's iſland; growing likewiſe above water.

9. U. *Baueri*. Bauerian Bladderwort. Brown n. 7.—"Stalk capillary, moſtly ſimple, with a few diſtant ſcales about the middle. Flowers racemoſe. Lips undivided; the uppear linear; lower broader than long. Spur ſtraight, deſcending, bluntiſh, longer than the lips."—Gathered near Port Jackſon, by Mr. Ferdinand Bauer.

10. U. *lateriflora*. Lateral-flowered Bladderwort. Brown n. 8.—"Stalk capillary, ſimple, round, with diſtant ſcales at the baſe. Flowers lateral, ſomewhat ſpiked. Upper lip linear, rather abrupt; lower roundiſh, obſcurely crenate. Spur emarginate."—Native of Port Jackſon, and Van Diemen's iſland. *Brown*.

11. U. *parviflora*. Small-flowered Zigzag Bladderwort. Brown n. 9.—Stalk nearly ſimple, angular, ſomewhat zigzag, with minute ſcales at the baſe. Flowers lateral, diſtant, nearly ſeſſile. Upper lip linear, emarginate; lower roundiſh, undivided. Palate rugoſe. Spur ſtraight, bluntiſh. Lower calyx-leaf emarginate.—Sent by Dr. White, from New South Wales, in 1792. The *ſtalk* is from four to ſix inches high, and though ſeldom branched, ſeems to elongate itſelf annually by a lateral ſhoot juſt below the top. Of the *leaves* we know nothing. There are many minute pointed *ſcales*, ſcattered along the ſtalk. The *ſpur* is thick, full as long as the lips. *Palate* downy.

12. U. *ſimplex*. Simple Capillary Bladderwort. Brown n. 10.—"Stalk capillary, quite ſimple, ſingle-flowered. Lips rounded, undivided; the lowermoſt broader than long. Spur ſtraight, depreſſed, emarginate."—Found by Mr. Brown, on the ſouth coaſt of New Holland.

13. U. *violacea*. Simple Violet Bladderwort. Brown n. 11.—"Stalk capillary, quite ſimple, ſingle-flowered. Lips nearly entire; the lower deflexed, as long as the deſcending, nearly cylindrical, undivided ſpur. Leaf ovate, generally ſolitary."—Gathered by Mr. Brown, in the ſame country.

14. U. *Menzieſii*. Menzieſian Bladderwort. Brown n. 12.—"Stalk thread-ſhaped, ſingle-flowered. Leaves numerous, ſpatulate. Lower lip undivided. Spur deſcending, cylindrical, obtuſe, twice the length of the lips."—Gathered by Mr. Menzies, on the ſouth-weſt coaſt of New Holland. We do not diſcover it amongſt the ſpecimens with which he has favoured us; nor did Mr. Brown gather this ſpecies himſelf.

15. U. *albiflora*. Small White-flowered Bladderwort. Brown n. 13.—"Stalk thread-ſhaped, ſingle-flowered. Upper lip emarginate; lower wedge-ſhaped, with three teeth. Spur conical, deſcending."—Gathered by Banks and Solander, in the tropical part of New Holland.

16. U. *compreſſa*. Flat-ſpurred Bladderwort. Brown n. 14.—"Stalk . . . . Upper lip emarginate; lower ſomewhat three-lobed, the middle lobe emarginate. Spur conical, flattened, pointing upwards."—Found by the diſtinguiſhed botaniſts juſt named, in the ſame part of New Holland as the preceding.

17. U. *ſtriatula*. Little Striated Bladderwort.—Leaves orbicular. Stalk ſimple, angular, with a few racemoſe flowers. Spur awl-ſhaped, acute, as long as the lips. Calyx-leaves permanent, very unequal; the upper one orbicular, emarginate, ſtriated.—Brought from Sierra Leone, by Dr. Afzelius. A ſmall delicate ſpecies, whoſe fibrous *roots* bear a few minute tubercles. The *leaves* are ſeveral, ſtalked, ſcarcely a line in diameter, ſmooth, with divaricating veins: ſome of them apparently concave, or bladdery. *Stalk* near three inches high, ſlender, ſmooth, bearing ſcarcely more than one ſcale towards the middle, and terminating in a *cluſter* of three or four purpliſh *flowers*, on capillary ſtalks, whoſe lower *lip* ſeems cloven. The membranous *capſule* is accompanied by the likewiſe membranous, pale, permanent, ſpreading *calyx*, whoſe lower leaf is ſmall and obtuſe; the upper five times as large, orbicular, with ſeveral purpliſh longitudinal ribs.

18. U. *cyanea*. Sky-blue Bladderwort. Brown n. 15.—"Stalk ſimple, ſtraight, with a few lateral remote flowers; partial ſtalks with three bracteas. Calyx acute, about equal to the corolla. Lips entire. Spur conical-awl-ſhaped, acute, deſcending. Capſule compreſſed. Leaves linear, decumbent."—Gathered by Mr. Brown, at Port Jackſon, New South Wales.

19. U. *graminifolia*. Graſſy Bladderwort. Vahl n. 3. Brown n. 16. (U. cærulea; Herb. Linn. but not Sp. Pl. U. uliginoſa; Vahl n. 25?)—Stalk ſimple, angular, diſtantly racemoſe; partial ſtalks with three bracteas. Calyx acute. Upper lip of the corolla emarginate; lower ſomewhat three-lobed. Spur deſcending, conical. Capſule compreſſed. Leaves linear-elongated.—Native of the dried margins of ponds, in the Eaſt Indies. We have ſpecimens from Dr. Buchanan, gathered in the Myſore country. Sir Joſeph Banks found this ſpecies in the tropical part of New Holland. Linnæus confounded it with his original *cærulea*, deſcribed in our 4th ſection, n. 47, but the preſent plant is furniſhed with one or more graſſy, acute, ſeſſile, radical *leaves*, half as tall as the ſtalk, detected by profeſſor Vahl and Mr. Brown. The common *flower-ſtalk* is rather ſtout, from three to ſix inches high, not branched, but ſometimes, as in ſeveral other ſpecies, elongated by a lateral ſhoot, either in conſequence of its having flowered before, or having been broken off. *Cluſter* wavy, lax, of three or four blue *flowers*, whoſe *partial ſtalks* ſpread horizontally as they ripen ſeed. *Calyx* permanent, its leaves ovate, acute, membranous, ſtriated, cloſely embracing the capſule; one of them emarginate. One of Koenig's original ſpecimens of his *U. uliginoſa*, now before us, is ſo imperfect, that we labour under the ſame difficulty as Mr. Brown, in deciding whether it belongs to this or the laſt ſpecies.

20. U. *bifida*. Divided Yellow Bladderwort. Oſbeck It. 243. t. 3. f. 2. Engliſh ed. v. 2. 1. t. 3. f. 2. Linn. Sp. Pl. 26. Willd. n. 8. Vahl n. 24.—Stalk ſimple or divided, racemoſe. Bracteas ſolitary. Calyx acute. Upper lip of the corolla ovate, undivided; lower cloven. Spur deſcending, conical, acute, the length of the upper lip. Leaves linear, ſtalked.—Gathered by Oſbeck, near the watering-place on the Daniſh iſland, off Canton, in ſwampy ground, but not under water, flowering in October. It has alſo been found in Ceylon, from whence we have ſpecimens, one of which is accompanied with *leaves*, hitherto unnoticed by any botaniſt. The very ſpecimens delineated in Oſbeck's voyage, are preſerved in the Linnæan herbarium. This ſpecies is certainly allied to the laſt, but rather ſmaller, with yellow *flowers*. The *ſtalk* is ſometimes divided, or interrupted, as in that. *Leaves* very ſmall, narrow and obtuſe, ſpringing from the fibrous *roots*, or rather from ſmall

small tuberous offsets. *Stalk* three or four inches high. *Calyx* permanent, membranous, as in the foregoing, but more orbicular, and less evidently striated.

21. U. *biloba*. Two-lobed Bladderwort. Brown n. 17. —"Stalk simple, round, with distant close-pressed scales. Cluster of few flowers. Bracteas solitary. Upper lip of the corolla emarginate; lower in two blunt lobes. Spur straight, descending, obtuse, somewhat flattened."—Found by Mr. Brown, in the vicinity of Port Jackson, New South Wales.

22. U. *limosa*. Mud Bladderwort. Brown n. 18.—"Stalk simple, round. Cluster many-flowered. Upper lip of the corolla undivided; lower in two sharpish divaricated lobes. Spur prominent, somewhat flattened." — Gathered by Banks and Solander, in some part of the tropical region of New Holland.

23. V. *pygmaea*. Dwarf Bladderwort. Brown n. 19.—"Stalk simple, about two-flowered. Upper lip of the corolla undivided; lower in three deep undivided segments, the lateral ones linear, divaricated. Spur conical, prominent."—Found by the same travellers, along with the preceding species.

24. U. *tenella*. Delicate Bladderwort. Brown n. 20.—"Stalk nearly simple, few-flowered. Upper lip of the corolla deeply divided; lower in three undivided lobes, the central one largest. Leaves elliptical." — Found by Mr. Brown in the southern part of New Holland.

25. U. *barbata*. Bearded Bladderwort. Brown n. 21.—"Stalk nearly simple, few-flowered. Upper lip of the corolla emarginate; lower three-cleft, the middle segment divided. Palate internally bearded. Spur awl-shaped, descending."—Found by Banks and Solander, in the tropical part of New Holland.

26. U. *flava*. Slender Yellow Bladderwort. Brown n. 22.—"Stalk thread-shaped. Cluster of many dispersed flowers. Upper lip of the corolla divided; lower in three undivided lobes. Spur awl-shaped, descending." — From the same part of New Holland, gathered by the same botanists.

27. U. *chrysantha*. Branched Golden-flowered Bladderwort. Brown n. 23. — "Stalk somewhat branched. Clusters many-flowered. Upper lip of the corolla cloven; lower four-lobed. Spur conical-awl-shaped, descending. Bracteas three to each partial stalk, coloured like the calyx."—Gathered by sir Joseph Banks, in the tropical region of New Holland.

28. U. *multifida*. Many-lobed Bladderwort. Brown n. 24.—Stalk simple, thread-shaped, about two-flowered. Upper lip of the corolla oblong, with two awl-shaped segments; lower in three, nearly equal, divided lobes, with emarginate segments. Spur obtuse, compressed. Leaves spatulate.—Gathered by Mr. Menzies, at King George's Sound, on the south-west coast of New Holland. The *roots* are fibrous, beset with small knobs. *Leaves* numerous, collected into a tuft at the crown of the root, spatulate, or obovate, tapering down into slender stalks, about twice their own length, both together scarcely exceeding half an inch. *Stalk* six inches high, straight, smooth and naked, bearing at the summit two crimson *flowers*, whose large subdivided lower *lip* makes a very conspicuous appearance, and is thrice as long as the short broad *spur*.

Sect. 2. *Leaves radical, compound. Stalks whorled with leafy bladdery bracteas.*

29. U. *inflexa*. Inflexed Whorled Bladderwort. Forsk. Ægypt.-Arab. 9. Vahl n. 4. — "Whorled bracteas lanceolate, somewhat cylindrical, undivided, slightly bearded at the end. Nectary conical, ascending."—Found by Forskall plentifully in the ditches of rice-fields at Rosetta. The Arabians name it *Hamul*. The same was observed by Thonning, in stagnant waters on the coast of Guinea. *Vahl.* The radical *shoots* are a span long or more. *Leaves* three or four in a whorl, with scattered, very narrow, forked *leaflets*. *Bracteas* from four to eight towards the base of the *flower-stalk*, sessile, often an inch long, acute at each end, bearded at the summit with leafy fragments. *Stalk* a finger's length, thread-shaped, bearing from six to nine *flowers*, with a dry, lanceolate, sheathing *scale*, at the base of each *partial stalk*, and of the same length. The radical *leaves* are with or without bladders. *Vahl.* Mr. Thonning, quoted by this author, informs us that the inflated cellular *bracteas* serve to float the upright flower-stalks upon the surface of the water. The *corolla* is whitish, with purple veins; its *upper lip* tapering, obtuse, emarginate, concave; *lower* roundish; *mouth* closed by the palate. *Spur* nearly the length of the lower lip, conical, obtuse, curved upwards. *Capsule* the size of a pea, globose, very smooth, pointed with the style, bursting all round, its base attached to the fleshy enlarged *calyx*.

30. U. *stellaris*. Yellow Whorled Bladderwort. Linn. Suppl. 86. Willd. n. 11. Vahl n. 5. Roxb. Coromand. v. 2. 42. t. 180. — Whorled bracteas globose-oblong, undivided, copiously bearded. — Native of deep ditches in the rice-fields of the East Indies, where it was first noticed by Koenig. Very nearly akin to the last, which was long confounded with it, but Vahl observed truly, that the radical stalks, bearing the *leaves*, in the true *U. stellaris*, are not so stout, nor, as far as can be ascertained from dried specimens, at all cellular. The *flower-stalk* also is more slender, bearing its whorl of *bracteas* above half way up, towards the flowers, not at the base. These *bracteas* are but a quarter the size of the others, being scarcely three-quarters of an inch long, and are obtuse, much more copiously bearded, though we do not find them, as he says, all over covered with leafy fragments. The *flowers*, too, are smaller, and yellow, not whitish veined with purple. The *spur* is thick and blunt, twice the length of the *calyx*, but shorter than the lower lip of the *corolla*, as Koenig rightly describes it. Roxburgh's figure has no beard to the *bracteas*.

31. U. *ceratophylla*. Horn-leaved Bladderwort. Michaux Boreal.-Amer. v. 1. 12. Vahl n. 6. Pursh n. 1. (U. inflata; Walt. Carol. 64.) — "Whorled bracteas cylindrical, bladdery, divided, copiously bearded at the extremity."—Floating in the ponds and lakes of Virginia and Lower Carolina, flowering in June and July. *Flowers* yellow. *Pursh.* Like the foregoing. The *leaves* are five or six, an inch and a half long, first deeply divided, then three-cleft, slightly dilated towards the ends. *Stalk* smooth, a span high, or more, bearing from four to six distant racemose *flowers*, their lower partial stalks an inch in length. The beards of the *bracteas* are longer, and more branched, than in *U. stellata*. *Vahl.*

Sect. 3. *Leaves radical, compound. Stalks leafless.*

32. U. *foliosa*. Fennel-leaved Bladderwort. Linn. Sp. Pl. 26. Willd. n. 2. Vahl n. 7. (U. n. 197; Loefl. It. 281. Linaria palustris, foeniculi folio; Plum. Ic. 158. t. 165. f. 2.) — Spur conical, acute. Cluster cylindrical, many-flowered. Fruit drooping. Root creeping. Leaves without bladders.—Native of South America. The floating horizontal thread-shaped *roots* throw out long fibres, and from the same point alternate, repeatedly compound *leaves*, two or three inches long, with bristle-shaped, or almost capillary, *leaflets*, but unattended by the remarkable bladders

of

of our European species hereafter described. Some leaves are accompanied by an erect racemose *flower-stalk*, from four to eight inches high, bearing from six to twelve erect yellow *flowers*, the size and shape of *U. vulgaris*, but with a more pointed *nectary*, and the *fruit* is bent downwards as it ripens.

33. U. *flexuosa*. Zigzag-stalked Bladderwort. Vahl n. 8. Poiret n. 11.—Stalk zigzag, racemose. Fruit-stalks reflexed. Leaves furnished with bladders. — Native of the East Indies. *Leaves* and *bladders* as in the following, but the *flowers* are smaller, six or seven upon each *stalk*; their scales and *bracteas* similar to that species.

34. U. *vulgaris*. Greater Bladderwort, or Hooded Milfoil. Linn. Sp. Pl. 26. Willd. n. 3. Vahl n. 9. Fl. Brit. n. 1. Engl. Bot. t. 253. Pursh n. 2. Poit. et Turpin Paris. t. 30. Fl. Dan. t. 138. (Lentibularia; Riv. Monop. Irr. t. 79.) — Spur conical. Stalk straight. Cluster somewhat corymbose. Upper lip of the corolla the length of the palate, reflexed at the sides.—Native of ditches and deep standing waters, throughout Europe, from Lapland to Greece; also in the western parts of New York and Pennsylvania, according to Mr. Pursh; flowering in July. The trailing or floating perennial *roots*, or *runners*, bear alternate, repeatedly compound, capillary *leaves*, furnished with minute bristles, and bearing numerous little oval compressed curved *bladders*, open and bearded at the tip, each containing a bubble of air, along with a drop of watery fluid. Minute aquatic insects take up their abode in these bladders. *Flower-stalks* solitary, a foot high, though rising but a few inches above the surface of the water, each bearing a corymbose *cluster* of from five to eight large handsome yellow *flowers*, each of whose partial stalks is subtended by an elliptical, blunt, purplish, scaly *bractea*, similar to what are scattered down the main stalk. *Calyx* purplish; its lower leaf emarginate. *Palate* of the *corolla* tumid, orange-coloured, striped, projecting nearly as far as either of the lips.

It seems best to consider the floating shoots of this herb, and the species of the same section, which bear alternate, repeatedly compound, *leaves*, rather as runners from the *root*, than real *stems*. At least this hypothesis is countenanced by many of the plants in the first, as well as second, section.

35. U. *intermedia*. Intermediate Bladderwort, or Hooded Milfoil. Hayne in Schrad. Journ. for 1800. 18. t. 5. Vahl n. 10. Sm. Compend. ed. 2. 5. Engl. Bot. t. 2489. (U. vulgaris minor; Linn. Sp. Pl. 26. Fl. Suec. 9. Millefolium aquaticum, flore luteo galericulato; Lob. Ic. 791. M. palustre galericulatum; Ger. Em. 828.) —Spur conical. Stalk two or three-flowered. Upper lip of the corolla flat, twice as long as the palate. Leaves with deep, forked, flat segments. Bladders radical.—Native of lakes and stagnant waters, in Sweden, Germany, and Ireland, flowering in July. The *runners* seem to originate from an ovate, scaly, hairy, tuberous *root*, or *knob*, and are thickly clothed with much smaller, more simple, *leaves* than the last, whose fringed segments are broader and flatter. These *leaves* scarcely bear any bladders, the latter being found on other parts of the runners, on branching stalks, and more sparingly. *Stalk* slender, bearing but two, or at most three, *flowers*, smaller than those of the *vulgaris*, but in like manner streaked with red; their *palate* less prominent; upper lip flatter.

The wooden cut in Lobel and Gerarde exactly represents the herbage of this species, with its large *knobs*, and no doubt their synonyms are to be transferred hither. The flowering portions may have been, partly at least, delineated from the last, both being, as it seems, nearly equally common on the continent, and having been generally confounded together, even by Linnæus himself. We must not, however, omit to observe, that M. Turpin, in his exquisite plates of the *Flora Parisiensis*, represents *knobs*, or as he perhaps more correctly terms them, *buds*, in the *vulgaris*, and even the *minor*, though of a smaller size, in both, than we find them in the *intermedia*. These appear destined to produce plants in the following season.

36. U. *australis*. Southern Bladderwort, or New Holland Hooded Milfoil. Brown n. 1.—" Stalk with few flowers. Lips undivided; the lower twice as broad as long. Spur ascending; flat in front; keeled underneath. Leaves bearing bladders."—Observed by Mr. Brown, about Port Jackson, New South Wales, as well as in the island of Van Diemen. Very nearly related to *U. vulgaris*. *Brown*.

37. U. *minor*. Lesser Bladderwort, or Hooded Milfoil. Linn. Sp. Pl. 26. Willd. n. 4. Vahl n. 11. Fl. Brit. n. 2. Engl. Bot. t. 254. Pursh n. 3. Poit. et Turp. Parif. t. 31. Fl. Dan. t. 128. Schmidel Ic. t. 21. f. 1. (Millefolium palustre, galericulatum minus; Pluk. Phyt. t. 99. f. 6, very bad. Aparine aquæ innatans Terevisana, &c.; Bocc. Muf. v. 1. 23. t. 4, without flowers, but otherwise sufficiently correct.)—Stalk with few flowers. Spur short, obtuse, keeled, deflexed. Corolla gaping; palate nearly flat; lips undivided.—Native of ditches, on bogs in most parts of Europe, but not common in England, flowering in July. Mr. Pursh met with it in swamps and ditches on the " pine-barrens" of New Jersey, flowering in August This species is not half the size of *U. vulgaris*, with which it agrees in habit, *foliage*, though less compound, and *bladders*. The *stalk* is less straight, more slender. *Flowers* rather fewer, with a much shorter and very blunt spur; *lips* scarcely divided, or notched; *palate* so little elevated as not to close the mouth.

38. U. *exoleta*. Faded Bladderwort, or Hooded Milfoil. Brown n. 2.—" Stalk with one or two flowers. Lower lip undivided; upper sometimes half three-lobed. Spur ascending, emarginate."—Found by Mr. Brown, near Port Jackson, New South Wales. It is said to be closely related to the last.

39. U. *fibrosa*. Fibrous Bladderwort. Walt. Carol. 64. Vahl n. 12. Pursh n. 4.—Stalk with one or two flowers, almost capillary. Spur obtuse. Leaves bristle-shaped.—In morasses on the pine-barrens of Carolina, flowering in July. *Stalks* purple. *Flowers* orange. *Pursh*. Vahl terms the *leaves*, as well as *stalk*, peculiarly slender. The former are furnished with roundish-oblong *bladders*; the latter is a finger's length, compressed, bearing one or two large *flowers*.

Poiret confounds this species with the *setacea* of Michaux; but as Vahl, who appears to have seen both, keeps them distinct, we confide in his opinion. Pursh considers *setacea* as the *subulata* of Linnæus, see n. 45.

40. U. *obtusa*. Abrupt-spurred Bladderwort. Swartz Prodr. 14. Ind. Occ. 41. Willd. n. 5. Vahl n. 13. (U. n. 1; Browne Jam. 119.)—Stalk with two or three flowers. Spur inflexed, somewhat emarginate. Mouth of the corolla closed.—Native of stagnant waters, and boggy rivulets, in Jamaica, flowering throughout the summer. Linnæus mistook Browne's plant for his own *foliosa*, n. 32, which is much larger, and very different in other respects. The *obtusa* is rather smaller than our *minor*, with more capillary *leaflets*, and smaller *bladders*. *Stalk* two to four inches high, slender, without scales, racemose, bearing from two to four small, yellow *flowers*, " in beautiful succession," as Dr. Browne expresses it. Their upper *lip* is ovate, convex, undivided; *lower* rather smaller, ovate, its prominent heart-

heart-shaped *palate* closing the mouth of the *corolla*. *Spur* ſcarcely longer than the lip, inflexed towards its under ſide, conical. *Swartz.*

41. U. *gibba*. Tumid-ſpurred Bladderwort. Linn. Sp. Pl. 26. Willd. n. 7. Vahl n. 30. Purſh n. 9. (U. florum nectario gibboſo, ſcapo nunc unifloro, nunc bifloro; Gron. Virg. ed. 1. 129. Fucoides viride non ramoſum, folia ad genicula diverſa, tenuiſſima, ſericea, oppoſita, veſiculis nonnihil compreſſis lentibus ſimilibus, colore antimonii, obſita, gerens; Clayton n. 759. *Herb. Linn.*)—Stalk wavy, almoſt capillary, with one or two flowers. Spur conical, tumid, bluntiſh. Lips of the corolla rounded.—Native of the boggy ſoil of New Jerſey and Carolina, flowering in July. *Flowers* yellow. *Purſh.* This has been erroneouſly arranged among the leafleſs ſpecies. The *leaflets* are briſtle-ſhaped, accompanied by numerous *bladders*, larger than in the laſt, though the *flower-ſtalks* are ſmaller, from two to three inches high, almoſt capillary, and ſomewhat zigzag. *Flowers* about the ſame ſize. The Linnæan ſpecimens, from Gronovius and Clayton, will not allow us clearly to aſcertain the ſhape of the *corolla*. The *ſpur* ſeems ſtraight and prominent, rather ſhorter than the *lips*.

42. U. *hydrocarpa*. Reflexed-ſtalked Bladderwort. Vahl n. 14.—"Stalk thread-ſhaped; partial ſtalks alternate, remote; reflexed when in fruit. Leaves briſtle-ſhaped."—Found by M. Richard in Cayenne. *Leaves* very ſlender, ſhort, ſcarcely divided, furniſhed with *bladders*. *Stalk* the length of the middle finger, with five partial ſtalks, half an inch long. *Bracteas* ovate. *Calyx* of the fruit ovate, ſpreading at the ſummit. *Corolla* purpliſh. *Capſule* globoſe, the ſize of the calyx, beaked with the *ſtyle*. Koenig ſent from Ceylon, under the name of *U. major*, what ſeemed the ſame with this in its whole ſtructure, and in which the *ſpur* was conical, obtuſe, the length of the upper lip. They could ſcarcely be ſpecifically diſtinguiſhed, eſpecially as the *ſpur* of the *U. hydrocarpa* is unknown. *Vahl.*

43. U. *aurea*. Golden Floating Bladderwort. Loureir. Cochinch. 26. Vahl n. 22.—Stalk round, erect. Flowers racemoſe. Calyx lanceolate. Spur conical, compreſſed. Leaves capillary, with bladders.—Native of ſlow ſtreams in Cochinchina, where this ſpecies is known by the name of *Cây raong*. The *runners* are very long, ſlender, branched, floating. *Leaves* very numerous, capillary, green, ſubdivided, furniſhed with bladders. *Stalk* three inches high. *Flowers* of a golden yellow. *Calyx* incurved. *Corolla* deeply divided, its *throat* (rather *palate*) convex, emarginate. *Loureiro.* It is evident that what Loureiro calls *ſtem*, is what we have in ſome preceding ſpecies termed *runners*, and that his *roots* are real *leaves*. Vahl, therefore, might juſtly doubt whether he had done right in placing this among the leafleſs ſpecies. He appears by ſome accident to have tranſpoſed the places of *aurea* and *recurva*; ſee n. 51.

44. U. *biflora*. Little Two-flowered Bladderwort. Lamarck Illuſtr. v. 1. 50. Vahl n. 16. Purſh n. 5. (U. pumila; Walt. Carol. 64.)—Stalk moſtly two-flowered, thread-ſhaped. Spur awl-ſhaped, ſtraight, about equal to the upper lip. Leaves briſtle-ſhaped.—On the margins of ponds in Lower Carolina, flowering in July. *Flowers* ſmall, yellow. *Purſh.* *Leaves* ſhort, furniſhed with bladders. *Stalk* ſlender, four inches high, ſometimes zigzag, in a dry ſtate angular below, naked. *Partial ſtalks* one or two at the top, as long as the nail. *Bractea* membranous, abrupt, at the baſe of one of the patial ſtalks, and on the other towards the *calyx*. Upper *lip* as long as the nail. *Vahl.* We are not without a ſuſpicion of this being the ſame plant as *U. gibba*, ſee n. 41, but have no means of proving it ſo.

45. U. *ſubulata*. Awl-ſhaped Bladderwort. Linn. Sp. Pl. 26. Willd. n. 113. Vahl n. 34. Purſh n. 6. (U. ſetacea; Michaux Boreal.-Amer. v. 1. 12. Vahl n. 17. Poiret n. 14, excluding the *fibroſa* of Walter and Vahl. U. nectario ſubulato; Gron. Virg. 6, excluding the abſurd reference to Clayton, of a *Pyrola* with round ſerrated leaves.)—"Stalk about two-flowered. Spur obtuſe, ſhorter than the upper lip."—In ſandy wet places, near ponds and rivers, from Canada to Carolina, common, flowering in July and Auguſt. *Root* annual. *Flowers* ſmall, bright yellow. *Purſh.* This author compared his ſpecimens with the original ones of Gronovius, the only authority in this caſe. No ſpecies has given us more trouble than the preſent. Linnæus, in *Mant.* 2. 317, ſays, on the authority of Clayton, that the *leaves* are capillary, and the *flowers* white. This is tranſcribed by Willdenow, but noticed by no other perſon. Linnæus, ſubſequently to the publication of *Sp. Pl.*, laid into his herbarium for *U. ſubulata*, a totally different plant of Kalm's, which happens to have an awl-ſhaped ſpur, and is the *cornuta* of Michaux, Vahl and Purſh. This cannot be the plant of Gronovius. The reader will perceive that, though Vahl has kept *ſubulata* and *ſetacea* diſtinct from each other, his ſpecific characters are of little avail, unleſs the latter ſpecies be deſtitute of *leaves*, in which caſe it ought to have been placed in the next ſection.

46. U. *purpurea*. Little Purple Bladderwort. Walt. Carol. 64. Vahl n. 28. Purſh n. 7.—Stalk with two or three flowers. Spur keeled, very ſhort. Lips of the corolla rounded. Leaves capillary.—An annual ſpecies, found floating in the lakes and ponds of Carolina; alſo in thoſe of Pennſylvania, on the broad mountains; flowering in Auguſt. *Flowers* bright purple, ſmall. *Purſh.*

Sect. 4. *Deſtitute of leaves.*

47. U. *cærulea*. Blue Ceylon Bladderwort. Linn. Sp. Pl. 26, excluding the ſynonym of Rheede. Willd. n. 10. Vahl n. 20? (U. ſcapo nudo-ſquamis alternis vagis ſubulatis; Linn. Zeyl. 9.)—Stalk erect, thread-ſhaped, with ſcattered awl-ſhaped ſcales. Spike denſe. Calyx-leaves orbicular. Spur the length of the lips.—Native of Ceylon. Examined in Hermann's herbarium, from whence Linnæus deſcribed this ſpecies, referring to it ſynonyms which belong partly to the following. The *ſtem* is without leaves, about ſix inches high, terminating in a ſhort denſe *ſpike*, of nearly ſeſſile *flowers*, whoſe colour, according to Hermann, is blue. The orbicular *calyx-leaves* clearly diſtinguiſh this from the following, as well as from our *graminifolia*, n. 19, confounded herewith by Linnæus, in his own herbarium.

48. U. *reticulata*. Reticulated Bladderwort. Sm. Exot. Bot. v. 2. 119. t. 119. (Nelipu; Rheede Hort. Malab. v. 9. 137. t. 70.)—Stalk twining, round, with ſcattered acute ſcales. Calyx pointed, as long as the corolla. Spur awl-ſhaped. Lips rounded. Palate reticulated, two-lobed. Native of inundated rice-grounds, in various parts of the Eaſt Indies, which, according to Dr. Buchanan, are covered with its moſt elegant blue flowers, in December. *Root* ſmall, with whorled fibres, apparently annual. *Leaves* none. *Stalk* from nine to twelve inches high, twining round the rice-ſtems, in the manner of our *ſpiralis*, n. 5, ſmooth, either ſimple or divided, bearing many ſmall, alternate, cloſe-preſſed *ſcales*. *Cluſters* one or more, terminal, lax. *Flowers* the ſize of violets, and nearly of the ſame colour; their *palate* cloſing the mouth, very prominent, divided, white, reticulated with pale blue veins; their *partial ſtalks* tapering at the baſe, each accompanied by three ſmall permanent

manent *bracteas*. *Spur* blueish-white, the length of the lower *lip*, which is somewhat the largest.

49. U. *juncea*. Rushy Bladderwort. Vahl n. 21.—Stalk straight, racemose, with minute distant scales. Spur awl-shaped, the length of the upper lip.—Native of Cayenne, and Porto Rico. *Roots* fibrous, very short, and nearly simple. *Stalk* a foot high, erect, straight, quite simple, round, smooth. *Scales* ovate, acute. *Flowers* from five to eight, on very short *partial stalks*, with a minute dry *bractea* at the base of each. *Vahl.*

50. U. *angulosa*. Angular Bladderwort. Poiret n. 23.—"Stalk thread-shaped, angular, with minute distant scales. Flowers somewhat racemose, nearly sessile. Spur awl-shaped, scarcely so long as the upper lip."—Native of wet situations in Cayenne. Very nearly related to *U. juncea*. *Roots* composed of short and slender fibres, without leaves. *Stalk* simple, stiff and straight, ten or twelve inches high, quite smooth, compressed and angular, yellowish; cylindrical, and of a brighter yellow, sometimes blueish or purplish at the base. *Scales* short, oval, pointed, scarcely discernible. *Flowers* from four to six, or more, in a straight terminal *spike* rather than *cluster*, with a small *bractea* to each. *Calyx-leaves* short and obtuse. *Corolla* middle-sized, deep yellow. *Spur* straight, acute. *Capsule* smooth, the size of a pepper-corn, crowned with the *style*. *Poiret.*

51. U. *recurva*. Recurved Bladderwort. Loureir. Cochinch. 26. Vahl n. 15.—Stalk slender. Flowers spiked. Spur conical, recurved, about the length of the lip.—Found in the river *Hòn Mô*, not far from the royal city, in Cochinchina.—*Root* short, without bladders. *Leaves* none. *Stalk* four inches high, simple, erect. *Flowers* yellow, in a simple oblong *spike*. *Calyx* large, round, compressed. *Capsule* lenticular. *Loureiro.* It can only have been from some accidental error, that Vahl placed this species in the former section, all his information concerning the plant being derived, like our's, from Loureiro, who is sufficiently clear as to its having no *leaves*. See n. 43.

52. U. *pusilla*. Little Cayenne Bladderwort. Vahl n. 23.—"Stalk capillary, subdivided; zigzag in the upper part. Flowers racemose, remote."—Found in Cayenne, by Richard, and Von Rohr. *Root* very short, subdivided. *Stalk* a finger's length, either quite simple, or divided towards the top, with a minute ovate scale. *Partial stalks* from five to eight, half the length of the nail, occupying nearly the upper half of the main stalk, and each having at its base an extremely minute *bractea*. *Capsule* very small. *Vahl.* We have specimens from Sierra Leone, gathered by Smeathman, and others by Afzelius, which so strikingly answer to every tittle of this description, that we cannot but consider this as one of the very few species of its genus found in Guinea as well as in South America.

53. U. *pubescens*. Downy-stalked Bladderwort.—Stalk capillary, downy, about two-flowered. Spur obtuse, the length of the upper lip; half the length of the lower, which is divided.—Gathered at Sierra Leone, by Dr. Afzelius. The *root* is a tuft of small fibres, without leaves or bladders. *Stalk* three or four inches high, erect, simple, slender, round, or slightly angular, perhaps from drying, clothed all over with fine prominent pubescence, not visible to the naked eye, but, as far as we can perceive, quite destitute of scales. *Flowers* two, one below the other, smaller than *U. minor*, each with a broad, obtuse, membranous *bractea*. *Lower lip* broad, deflexed, two-lobed.

54. U. *nivea*. Snowy Bladderwort. Vahl n. 26.—"Stalk about four-flowered, with close-pressed scales, separate at the base. Spur conical, obtuse. Capsules drooping, globose."—Gathered by Koenig, in moist dewy places in Ceylon. *Stalk* slender, from four to seven inches high, generally bearing four, rarely but three, large white *flowers*, on short partial stalks. *Vahl.*

55. U. *humilis*. Humble Bladderwort. Vahl n. 27.—Stalk angular, with few flowers. Spur conical, acute, shorter than the upper lip. Calyx-leaves roundish. Capsule keeled.—Native of the East Indies. *Roots* very short, scarcely branched. *Stalk* hardly above an inch and a half high, often bearing a solitary *flower*, sometimes two, three or four. *Scales* two or three, remote, ovate as well as the *bracteas*. *Vahl.*

56. U. *crenata*. Crenate-lipped Bladderwort. Vahl n. 28. ("U. aphylla; Fl. Peruv. v. 1. 20. t. 31. f. d.")—Stalk about three-flowered. Roots furnished with bladders. Bracteas sheathing. Spur awl-shaped. Lips crenate.—Native of moist or inundated ground at Lima. Annual. *Root* of several long fibres, bearing a few bladders, the size of mustard-seed. *Stalk* thread-shaped, from four to six inches high, smooth, naked, terminating in from two to four distant *partial stalks*, each an inch long, spreading, furnished at its base with a sheathing, abrupt, membranous, entire *bractea*. *Corolla* yellow; its upper *lip* with three or five notches; lower with three.—Our specimen, from the late abbé Cavanilles, though destitute of any evident *leaves*, or *leaflets*, yet having bladders attached to a long simple fibre, seems to indicate the propriety of ranging this species in the preceding section. We submit, nevertheless, to the decision of Vahl, and the authors of the *Flora Pedemontana*; more especially as the opinion of Mr. Brown, founded on such wide-extended observation as few botanists have had in their power, seems in favour of there being no *Utricularia* destitute of *leaves* at every period of its growth. This being the case, the whole genus must require to be distributed afresh. The next species stands in the same predicament.

57. U. *tenuis*. Bristle-stalked Bladderwort. Cavan. Ic. v. 5. 24. t. 440. f. 2. Vahl n. 29.—Stalk single-flowered. Roots furnished with bladders. Bracteas opposite. Spur awl-shaped, twice the length of the shortest lip.—Gathered by Louis Nee, in moist places, near the town of Coquimbo, in Chili, flowering in April. A small annual species, whose *roots*, consisting of several zigzag fibres, about an inch long, are copiously furnished with small, alternate, sessile bladders. (See our remarks on the last.) The *stalk* is bristle-shaped, an inch and a half or two inches high, quite naked, except two or three opposite *bracteas* near the top, which mark the base of the solitary *partial stalk*. *Flower* solitary, yellow. *Calyx* ovate, bluntish, permanent. *Lips* of the *corolla* very unequal, undivided, nearly ovate, the larger erect, accompanied by a prominent *palate* bordered with red; smaller deflexed, as well as the *nectary* behind it. The *flower* therefore seems to be reversed. The *capsule* is globular.

58. U. *micropetala*. Small-lipped Bladderwort.—Stalk about two-flowered. Partial stalks club-shaped. Bracteas opposite. Spur conical, dependent, thrice as long as the lips.—Gathered by Dr. Afzelius at Sierra Leone. A very distinct and remarkable species. The *root* is small and fibrous, without leaves or bladders. *Stalk* three inches high, bearing a few distant, ovate, white-edged scales. *Flowers* in our specimen two, one above the other, yellow, on stalks of unequal length swelling upwards, and having two opposite, ovate, pointed *bracteas* at the base of each. *Calyx-leaves* ovate, pointed; the lower one emarginate. *Lips* of the *corolla* about the length of the *calyx*, nearly equal, undivided; the lower of a deeper yellow, with a prominent *palate*, not closing the mouth. *Spur* remarkably large in proportion, making the chief part of the flower, stout, pointed. *Capsule* elliptical.

59. U. *ramosa*. Branching Drooping Bladderwort. Vahl n. 31.—" Stalk simple or branched, with few flowers. Spur conical, short. Fruit-stalks drooping."—Found by Koenig in the East Indies. *Roots* simple, and very short. *Stalk* a finger's length, angular, sometimes simple, often divided, the branches once or twice subdivided, two or three-flowered. *Scales*, as well as *bracteas*, ovate. *Flowers* small. *Vahl.*

60. U. *capillacea*. Capillary Bladderwort. Willd. n. 9. Vahl n. 32.—" Stalk capillary, with about three drooping flowers. Spur round, bluntish. Capsules awl-shaped."—Gathered by Dr. Rottler, in watery places in the East Indies. *Root* of several naked, somewhat branched, fibres. Vahl found, in one specimen, at the side of the crown of the *root*, an oblong-roundish bulb, the size of a Coriander-seed, clothed with bristles; separate at the summit and base, but attached to the root by a central ring. He justly presumed this to be a bud, by which the plant increases itself. The *stalk* is often hardly an inch high, angular, bearing one, two or three *flowers*, on short, drooping *partial stalks*, each accompanied, at the base, by an extremely minute ovate *bractea*. *Capsule* awl-shaped; covered by the permanent *calyx*.

61. U. *minutissima*. Little Malacca Bladderwort. Vahl n. 33.— Stalk capillary, two or three-flowered, unbranched. Scales and bracteas pointed. Spur conical. Lower calyx-leaf broadest, concave, keeled.—Gathered by Koenig, in the neighbourhood of Malacca. *Root* fibrous, small. *Stem* two inches high in our original specimens, Vahl says half an inch, or an inch. It appears to elongate itself, after flowering, by a lateral, upright, simple shoot, as is the case with *graminifolia*, n. 19, and some others. *Scales* one or two, tapering at each end, small. *Flowers* one, two, three or even four, each on a very short *partial stalk*, with several taper-pointed *bracteas* at its base. *Corolla* blue, extremely small, with a prominent *spur* full as long as the *lips*. *Calyx* inflated and enlarged considerably as the *fruit* ripens.

62. U. *cornuta*. Great Horned Bladderwort. Michaux Boreal.-Amer. v. 1. 12. Vahl n. 19. Pursh n. 8. (U. subulata; Herb. Linn. but not Sp. Pl.)—Stalk erect, slightly scaly, with about two nearly sessile flowers. Spur awl-shaped, acute, rather curved, nearly as long as the very broad lower lip.—Near mountain lakes, from Canada to Virginia, flowering in July. *Pursh*. Our specimens from Mr. Francis Boott, a young botanist of great zeal and activity, have dense alternate tufts of numerous *radical fibres*, without leaves or bladders. *Stalk* a foot high, straight, smooth, bearing a few small, distant, pale, membranous scales, and terminating in two or three crowded large *flowers*, of a bright yellow. *Calyx-leaves* broad, ovate, unequal, coloured; the lowermost not half the length of the *spur*. *Lower lip* very broad, deflexed, cloven. *Palate* downy.—Linnæus received this plant from Kalm, and laid it into his herbarium for *U. subulata*, which he had long before described from Gronovius's herbarium, but had forgotten the appearance of it; see our n. 45. We therefore adopt the name given by Michaux, for what must be considered as not described by Linnæus, he having no where adverted to Kalm's specimens. Vahl erroneously ranges this with the leafy species.

UTRICULUS, (a little bladder,) a term used by Gærtner, for a particular sort of capsule, which he defines as " of one cell, and containing a solitary seed; it is often very thin and semitransparent; constantly destitute of valves, and of a shape approaching to ovate, or somewhat globose." He adds, that " all naked seeds may, strictly speaking, be said to be inclosed in such a pericarp; but he limits the application of the above term to those coverings of seeds, which, in the first place, are capable of being rubbed off by a slight friction between the fingers, as in *Chenopodium*, *Atriplex*, and *Beta*; secondly, to such as are furnished, within their cavity, with an evident umbilical cord, as in *Adonis*, *Thalictrum*, and *Atragene*; thirdly, to those between which and the seed there is a vacant space, or cavity, sufficiently evident, of which *Eleusine*, *Achyranthes*, *Zueria*, *Illecebrum* and *Polycnemum* are examples; and fourthly, to such as contain their seed in an inverted position, so that the radicle of the embryo is turned towards the style, as *Callitriche*, *Zannichellia*, *Zostera*, &c.; the contrary position being most usual in the greater number of naked seeds, as in the natural orders of *Gramina*, *Compositæ*, *Verticillatæ*, and *Stellatæ*." See PERICARP and SEED.

UTRUM, *Juris Utrum*. See JURIS, ASSISE, &c.

UTSCHENYA, in *Geography*, a cape on the north coast of Nova Zembla. N. lat. 77° 20′. E. long. 67° 24′.

UTSCHING. See VOLGA.

UTSJOKI, a town of Swedish Lapland; 240 miles N. of Tornea. N. lat. 69° 45′. E. long. 26° 54′.

UTTA, a town of the island of Sardinia; 6 miles W.S.W. of Cagliari.—Also, a river of Sardinia, which runs into the sea, near Cagliari.

UTTAMA, in *Hindoo Mythology*, is the name of one of the seven holy men bearing the appellation of *Menu*, under which article their names and some notice of them will be found. In some theogonies Uttama is made the son of Pavaka, the regent of fire.

UTTARI, in *Ancient Geography*, a town of Hispania, on the route from Bracara to Asturica, between Pons Neviæ and Bergidam. Anton. Itin.

UTTENDORF, in *Geography*, a town of Bavaria, on the Mattig; 7 miles S. of Braunau.

UTTER, BARRISTER, in *Law*. See BARRISTER.

UTTERCUL, in *Geography*, a province of Assam, north of the Burhampooter.

UTTINGEN, a town of the county of Wertheim; 8 miles E. of Wertheim.

UTTOXETER, an ancient market-town in the south division of the hundred of Totmanslow, in the county of Stafford, England, is situated 13 miles N.E. by E. from the county-town, and 136 N.W. by N. from London, on the western bank of the river Dove, over which is a stone bridge, connecting the counties of Stafford and Derby. Great damage has been formerly sustained by this town from fire: but it is now large and well built, having a spacious market-place in the centre, with three streets branching out from it. The market, which is held on Wednesdays, is considered as the greatest in this part of the country, for cattle, sheep, pigs, butter, cheese, corn, and all kinds of provision and agricultural produce. This is attributed to the extensive meadow and pasture lands in this district, which are justly esteemed the most fertile and luxuriant England can boast. Leland says, " Uttok Cestre one paroch chirch. The menne of the towne usith grasing. For there be wonderful pastures upon Dove. It longgith to the erledom of Lancaster." Here are four annual fairs. In the population return of the year 1811, this town is stated to contain 637 houses, occupied by 3155 persons. Of these, the chief source of employment is the manufacture of iron, which is carried on to a great extent, the town being surrounded by forges. A great increase in this trade has taken place, in consequence of the facility of communication the town now enjoys by means of the inland navigation, not only with the metropolis, but, directly or indirectly, with every port in the kingdom. The church is an ancient edifice, with a lofty steeple, but no way remarkable

remarkable either for ftructure or embellifhments. Here are feveral meeting-houfes for Diffenters; and a free-fchool founded and endowed by Thomas Allen, a diftinguifhed antiquary and mathematician of the fixteenth century. The late admiral lord Gardner was born at Uttoxeter, April 12, 1742: he died in 1810, and was buried in the abbey church of Bath.—Beauties of England and Wales, vol. xiii. 1813.

UTUGARI, in *Ancient Geography*, the name of a people, who made part of the Huns. Ptolemy.

UTUS, a river, which, according to Pliny, had its fource in mount Hæmus, and watered Mœfia.—Alfo, a town of Dacia Ripenfis. Anton. Itin.

UTZHOF, in *Geography*, a town in the territory o Dantzic; 5 miles E. of Dantzic.

UTZNACH, a town of Switzerland, and capital of a bailiwick, which belongs to the cantons of Glaris and Schwitz, formerly belonging to the counts of Toggeburg. In the year 1469, it was fold to thofe two cantons, who alternately appoint a bailiff, whofe office continues two years. The inhabitants are Roman Catholics; 23 miles S.E. of Zurich. N. lat. 47° 8'. E. long. 8° 59'.

UVA, a lake of Ruffia, in the government of Tobolfk, about 28 miles in circumference; 68 miles S.E. of Tobolfk.

UVA, *Grape*. See VINE.

UVA *Gruina*, in the *Materia Medica*, the name of the fruit of the great American *vitis idæa*, or cranberries.

UVA *Lupina*, *wolf-berries*, in *Botany*, a name given by fome authors to the common water-elder, and by others to the *herba Paris*, or herb true-love.

UVA *Marina*, Sea-fide Grape, Uvette of the French. See EPHEDRA.

UVA *Paffa*, in the *Materia Medica*, the dried fruit of the vine, of which two kinds were formerly mentioned in our Pharmacopœias, *viz.* uvæ paffæ majores et minores, or raifins and currants; the latter is a variety of the former, or the fruit of the vitis corinthiaca feu apyrena, of C. B. The manner of preparing them is by immerfing them in a folution of alkaline falt, and foap ley made boiling hot, to which is added fome olive oil and a fmall quantity of common falt, and afterwards drying them in the fhade. Thefe fruits are ufed as agreeable lubricating acefcent fweets, in pectoral decoctions, and for obtunding the acrimony of other medicines, and rendering them grateful to the palate and ftomach. They are directed in the decoctum hordei compofitum, tinctura fennæ, and tinctura cardamomi compofita.

UVA *Quercus*, in *Natural Hiftory*, a name given to certain accidental productions of the oak, a tree famous for producing many fuch, befides its common fruit; the beft account we have of this in particular is from Mr. Marchant. He obferved a vaft quantity of this production upon an oak of about twelve feet high; this tree had no acorns, but there hung from almoft all the branches a great number of greyifh threads, of two inches or more in length, and of a filky flexible matter; to feveral parts of thefe there were fixed certain round berries, fometimes two or three, fometimes ten or twelve on a thread; thefe were of the fize of a half-ripe red goofeberry, but they had no umbilicus, nor any appearance of fibres; they were hard and not hollow, but filled with a cottony matter, very clofely compacted. The threads on which thefe berries were produced all grew out of the alæ of the leaves, in the very places where the buds of the rudiments of young branches fhould have come; and over thefe filaments there were often a few fmall leaves, of the regular fhape of the oak-leaf.

It is generally afferted, that there are eggs of infects lodged in all thefe extraordinary productions of the oak, which are fuppofed to be produced by a wrong derivation of the juices, occafioned by the puncture of the fly which leaves thofe eggs; but the moft accurate fearch could not difcover the leaft appearance of any animal remains in any part of thefe productions, neither in the berries, nor in the threads that fupport them.

There is another fpecies of this remarkable production, differing from the former, by not having the long threads on which the berries of that are fupported: this, however, has been confounded by the generality of naturalifts under the fame name, and of this Mr. Marchant has given an equally accurate defcription. In the month of October he obferved a young oak of about fix feet high, in a coppice-wood, in a very flourifhing condition, very full of branches and leaves, but without fruit. The young branches of this oak were loaded with clufters of red berries, of the fhape and fize of common red goofeberries; they ftood principally at or near the extremities of the branches, and were of a very polifhed and fhining furface, and of a fpongy and tender fubftance. They ftood in clufters of three, four, and five together, and each grew immediately to the branch, without any pedicle; they had fome appearance of fibres, but not the leaft mark of an umbilicus, as in the regular fruits. On opening thefe berries, they were found full of mucilaginous and vifcous juice, of a red colour, tolerably fluid, and having fome fibres intermingled with it; the tafte of this juice was acrid, and its fmell difagreeable, and like that of rotten wood; but there appeared not in thefe, any more than in the other fpecies, any the leaft appearance of any thing belonging to an animal, no egg, no worm, no fly, nor indeed any foreign body of any fort whatever.

Thefe berries, though fo large and fucculent, are but of a very fhort duration; for Mr. Marchant going three days after he had feen them in the greateft perfection, to gather fome of them, with intent to try their juice on different liquors, found they were all become flaccid and withered; and returning again three days after this, they were fo entirely perifhed and gone, that there remained only a few veftiges of thin fkins on the places where they had been fixed to the tree, and fome few fallen ones among the bufhes that grew under the tree; and upon inquiring of the people who lived thereabout, to know whether thefe berries were a regular annual production of the tree, they told him that they never remembered to have feen any thing of the kind before.

It may not be eafy, perhaps, to account regularly for thefe fortuitous productions, for they feem merely of the nature of monfters among animals; and it may be allowed no improbable conjecture in regard to them, that the roots of thefe fmall trees having taken in more nourifhment than they could circulate, when it came to load the tender extremities of the young branches, may have made its way through their laxer texture, and being retained yet in fome of their membranes, may have fwelled out more and more, by the addition of frefh matter, and finally have been matured by the fun's heat into thefe feemingly regular productions. Mem. Acad. Par. 1692.

UVA *Urfi*, in *Botany*, the name of a fpecies of arbutus, (fee ARBUTUS, n. 9.) with trailing ftalks, and entire leaves, called in Englifh *bear's whortleberry*. This plant is found on the fnowy hills of Auftria and Styria, but more plentifully on the Swedifh hills: it is alfo a native of the Highlands of Scotland, and is now cultivated in fome of our gardens. The leaves of this plant have a bitterifh aftringent tafte, without any remarkable fmell. Infufions of them in water

water ſtrike a deep black colour, with ſolution of chalybeate vitriol, but ſoon depoſit the black matter, and become clear. For their uſe in dyeing, ſee Dyeing *of Cloths*, &c.

The leaves of the uva urſi, though employed by the ancients in ſeveral diſeaſes requiring aſtringent medicines, had almoſt entirely fallen into diſuſe, till about the middle of the laſt century, when they firſt drew the attention of phyſicians as a uſeful remedy in calculous and nephritic complaints, and other diſorders of the urinary organs. See Stone.

De Haen relates, after large experience of this medicine in the hoſpital of Vienna, that ſuppurations, though obſtinate and of long continuance, in the kidneys, ureters, bladder, urethra, ſcrotum, and perineum, without any venereal taint or evident marks of a calculus, were in general completely cured by it; that of thoſe who had a manifeſt calculus, ſeveral found permanent relief, ſo that, long after the medicine had been left off, they continued free from pain or inconvenience in making water, though the catheter ſhewed that the calculus ſtill remained; that others, who ſeemed to be cured, relapſed on leaving off the medicine, and were again ſucceſſively relieved on repeating the uſe of it; while others obtained only temporary and precarious relief. In ſeveral caſes, paregorics were joined to the uva urſi, and other mild aſtringents have been recommended for the ſame intentions.

Encouraged by his ſucceſs, and by the practice of the phyſicians at Montpelier, who had been in the habit of preſcribing uva urſi in the diſeaſe above mentioned for many years before his time, many medical men in this country have been induced to try its effects; and though the uſe of this plant has been frequently obſerved to mitigate the pains in calculous caſes, yet in no inſtances do we find that it has produced that eſſential or permanent relief, which is ſaid to have been experienced by the German phyſicians.

From the experiments of Dr. Alexander, the leaves of uva urſi ſeem to poſſeſs very little diuretic power, and thoſe made by Murray ſhew that they have no material effect upon the urinary calculi: the efficacy they may, therefore, have in relieving the calculous diſeaſes, we are diſpoſed to aſcribe to their aſtringency; and in confirmation of this opinion we may cite the obſervation of Dr. Cullen, who, in his chapter on Aſtringents, notices the diſſertation of De Heucher, under the title of "Calculus per adſtringentia pellendus:" and though he does not think, with this author, that aſtringents are lithontriptics, yet from his own experience, and that of others, he believes they often have a powerful effect in relieving calculous ſymptoms; and in proof of this he refers to the exhibition of the uva urſi. The leaves may be employed either in powder or decoction; the former is moſt commonly preferred, and given in doſes from a ſcruple to a drachm two or three times a day.

Dr. Lewis obſerves, that the trials of the uva urſi, made in this country, have by no means anſwered expectation: in all caſes within his knowledge, it produced great ſickneſs and uneaſineſs, without any apparent benefit, though continued for a month. And in a caſe of incontinence of urine, Dr. Fothergill obſerves, the uva urſi, ſo much extolled of late in ulcers of the urinary paſſages, ſeemed but to aggravate the ſymptoms. (Med. Obſ. and Inſ. vol. iii. p. 144.) But in the preface to this volume we are told, that the uva urſi had been frequently preſcribed ſucceſsfully by many of the members of the Society of Phyſicians in London. It is obſerved by Murray, the calculi were macerated in a ſtrong decoction of the uva urſi. Dr. Withering, ſpeaking of the effects of this plant, ſays: Perhaps, upon the whole, we ſhall find it no better than other vegetable aſtringents; ſome of which have been long uſed by the country people in gravelly complaints, and with very great advantage; though hitherto unnoticed by the regular practitioners. Cullen. Lewis. Woodville.

Uva *Vulpis*, a name given by ſome authors to the common nightſhade.

UVARIA, in *Botany*, ſo named by Linnæus, from *uva*, a grape, or bunch of grapes, in alluſion to the appearance of its fruit.—Linn. Gen. 279. Schreb. 374. Willd. Sp. Pl. v. 2. 1261. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 333. Juſſ. 284. Lamarck Illuſtr. t. 495. De Candolle Syſt. v. 1. 481. Gærtn. t. 114.—Claſs and order, *Polyandria Polygynia*. Nat. Ord. *Coadunatæ*, Linn. *Anonæ*, Juſſ. *Anonaceæ*, De Cand.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, flat, in three deep, ovate, acute, permanent ſegments. *Cor.* Petals ſix, lanceolate, ſeſſile, ſpreading, longer than the calyx. *Stam.* Filaments none; anthers numerous, oblong, abrupt, covering the convex receptacle. *Piſt.* Germens numerous, crowded, concealed by the anthers; ſtyles numerous, the length of the anthers; ſtigmas obtuſe. *Peric.* Berries diſtinct, numerous, ſomewhat ſtalked, nearly globular, of ſeveral cells. *Seeds* four or more, in two rows.

Eſſ. Ch. Calyx in three deep ſegments. Petals ſix. Berries numerous, ſtalked. Seeds ſeveral, in two rows.

Linnæus and ſeveral following authors have referred to this genus a conſiderable number of ſpecies, with the nature of whoſe fruits they were not, in every inſtance, perfectly acquainted; eſpecially without ſufficient diſcrimination between ſuch as were true berries, and others of a capſular nature. The learned profeſſor De Candolle, now happily eſcaped from public perſecution in France, as a Proteſtant, and ſettled, with diſtinction, at Geneva, has juſt publiſhed the firſt volume of his *Regni Vegetabilis Syſtema Naturale*, a moſt profound and elaborate work, where the natural order to which the preſent genus belongs is illuſtrated, by a far greater number of ſpecies than it had ever before been ſuppoſed to contain. This author removes to Unona (ſee that article) many things hitherto conſidered as *Uvariæ*, making the character of *Unona* to conſiſt in its dry *fruits*, of an ovate-oblong, or ſomewhat beaded, ſhape. Hence the ſaid genus is extended to thirty-ſix ſpecies. We regret that our account of it had been ſent to the preſs, before the work of our learned friend reached us. We can now only profit by his labours, and trace his ſteps, through the genus *Uvaria*, of which he makes but eight ſpecies. Theſe are all natives of the Eaſt Indies, or the adjacent iſlands. They are trees or ſhrubs, with erect or trailing *ſtems*; the *flower-ſtalks* either axillary, oppoſite to the leaves, or lateral, ſolitary, or two or three together, bearing from one to four *flowers*, and often furniſhed with ſmall *bracteas*, or jointed in the middle. Several ſpecies referred by various botaniſts to the genus before us, now help to conſtitute a new one in profeſſor De Candolle's work, by the name of *Guatteria*, conſiſting of twenty in all. Its *fruits*, numerous likewiſe in each flower, are dry, coriaceous, ovate or globoſe, ſingle-ſeeded. *Uvaria japonica* of Linnæus, Thunberg, Willdenow, &c. ſtands by itſelf in a genus bearing the barbarous Japaneſe name of *Kadſura*, which Juſſieu, it ſeems, has unhappily ſelected, in the Annales du Muſeum, v. 16. 340. It comes next to *Anona*, having like that an aggregate pulpy fruit, but with two *ſeeds* in each cell, inſtead of the ſolitary ones of *Anona*.

1. U. *zeylanica*. Ceylon Uvaria. Linn. Sp. Pl. 756, excluding the ſynonyms of Rheede and Rumphius. De Cand. n. 1. Gærtn. f. 1. Lamarck f. 2. (Uvaria; Linn. Zeyl. 100. n. 224, not 234. Uva zeylanica ſylveſtris,

tris, mali armeniacæ sapore; Burm. Zeyl. 231.)—Branches trailing. Leaves ovato-lanceolate, smooth. Berries numerous, ovato-cylindrical, with tapering stalks. Internal processes of the coat of the seed in parallel plates.—Native of Ceylon. Linnæus and Burmann describe this as a trailing *shrub*, with smooth, pointed, stalked *leaves*, and scarlet starry *flowers*, each producing six or seven small, soft, grey, rather hairy, somewhat cylindrical *berries*, half an inch long, with a vinous taste, resembling that of an apricot. A specimen communicated, if we mistake not, by Thunberg to the younger Linnæus, for *Uvaria zeylanica*, has ovate, acute, smooth, entire *leaves*. The *common flower-stalks* are axillary, stout, half an inch long, each bearing two or more single-flowered, angular, downy *partial stalks*, thrice that length. *Calyx* half an inch in diameter, in three deep, broad, obtuse, coriaceous, downy segments, like Lamarck's fig. 1. *d, f, g*. *Anthers* oblong, spreading, yellow. We cannot say this is the true plant of Linnæus, Burmann, &c. because our specimen wants the fruit, which is almost all that is known of that species, with any precision.

2. U. *Gærtneri*. Gærtner's Uvaria. De Cand. n. 2. (U. trifoliata; Gærtn. f. 2. Lamarck f. 3.)—"Berries ovate, with tapering stalks. Internal processes of the coat of the seed awl-shaped."—Native probably of Ceylon. Nothing is known of this species but from Gærtner's figure of the *fruit*, which is rather larger, and less cylindrical, or constricted, than the foregoing, and differently constructed within.

3. U. *lutea*. Yellow Uvaria. Roxb. Coromand. v. 1. 32. t. 36. Willd. n. 8. De Cand. n. 3.—Leaves elliptic-oblong, acute, smooth, shining. Stalks solitary, from one to six-flowered. Berries oval, with six seeds.—Native of the hills of Hindoostan, adjoining to the coast of Coromandel, flowering in the hot season. A large evergreen *tree*, with a smooth brown bark, and alternate branches. *Leaves* two or three inches long, alternate, two-ranked, on short stalks. *Flower-stalks* opposite to the leaves, solitary, short and thick, each bearing usually about three dull-greenish *flowers*, above half an inch broad. *Petals* five times the size of the *calyx*. *Berries* four to six from each flower, spreading in the form of a star, on short stalks, nearly oval, orange-coloured, pulpy, each of them hardly an inch in length. Nothing is recorded of their flavour or qualities, nor of any use to which this tree is put. The Telingas call it *Muoy*.

4. U. *tomentosa*. Downy Uvaria. Roxb. Coromand. v. 1. 31. t. 35. Willd. n. 5. De Cand. n. 4.—Leaves ovate-oblong, acute, downy. Stalks single-flowered, usually solitary. Berries globular, with four seeds.—Native of the Circar mountains of Hindoostan, flowering in the hot season. This is also a large *tree*, with wide-spreading branches. *Leaves* soft and downy, on short stalks, their size rather exceeding those of the last species. *Flowers* solitary or in pairs, of a brownish-green, on stalks above an inch long. Three outer *petals* small and awl-shaped; three inner ovate, acute, above half an inch long. *Berries* nearly globular, from ten to fifteen, dull purple, the size of a bullace plum.

5. U. *dulcis*. Sweet Uvaria. "Dunal Monogr. 90. t. 13." De Cand. n. 5.—"Leaves oblong-elliptical; tapering and heart-shaped at the base; velvet-like beneath, as well as the branches. Flower-stalks in pairs, axillary, or opposite to the leaves; jointed and bracteated in the middle. —Native of Java, described by De Candolle from the herbarium of M. De Lessert. *Branches* round; villous and rusty in the upper part. *Leaves* from two to four inches long, on short villous stalks; sometimes pointed, and occasionally undulated; nearly smooth above; rusty, with a reddish rib, beneath. *Calyx* villous, rusty, in three broad, ovate segments. *Petals* villous, slightly wavy; the outer ones rusty at the back; inner broader, but rather smaller. *Pistils* villous. *Dunal*.

6. U. *javana*. Java Uvaria. "Dunal Monogr. 91. t. 14." De Cand. n. 6.—"Leaves oblong-elliptical; heart-shaped at the base; rusty and downy, like the young branches, beneath. Stalks axillary, or opposite to the leaves, few-flowered: partial ones somewhat umbellate, bracteated in the middle."—Gathered in Java, by M. Lahaie. The *branches* are round, marked with whitish spots; their young extremities clothed with rusty down. *Leaves* on very short stalks, sometimes pointed, sometimes blunt, waved at the edges, slightly falcate, with pinnate ribs; shining and nearly smooth on the upper side. *Stalks* solitary or in pairs, rusty, each bearing a sort of umbel, of from two to four *flowers*, whose *partial stalks* are jointed at the base, and furnished about the middle with one large clasping *bractea*. Segments of the *calyx* deep, broad, rather acute. Three inner *petals* reddish, rather larger and more oblong than the three outer. *Pistils* villous. *Dunal*.

7. U. *velutina*. Velvet-leaved Uvaria. De Cand. n. 7. (U. villosa; Roxb. MSS. Dunal Monogr. 91.)—"Leaves nearly sessile, ovate, pointed, clothed, like the branches, with velvet down; heart-shaped at the base. Stalks lateral, branched, downy; partial ones corymbose, single-flowered." —Sent by Dr. Roxburgh, from the East Indies, to Mr. Lambert. The young *branches*, both surfaces of the *leaves*, the *footstalks*, *flower-stalks*, and *calyx*, are clothed with very short, soft, greyish, velvet down. *Branches* round. *Leaves* almost perfectly sessile, two or three inches long, an inch and a half or two inches broad, with pinnate ribs, which are prominent and most downy at the back. Partial *flower-stalks* three or four, elongated, single-flowered, somewhat corymbose. *Calyx* small. *Petals* three, ovate, thick, bluntish; downy externally; brownish and smooth on the upper side; it is supposed there may be three others, which are deciduous. *Anthers* very short, nearly sessile. *Germens* densely crowded, somewhat downy. *De Candolle*.

8. U? *spectabilis*. Handsome-flowered Uvaria. De Cand. n. 8.—"Leaves oblong, pointed, almost smooth; clothed, like the branches, with rusty velvet down when young. Stalks lateral, or opposite to the leaves, single-flowered. Petals obovate; inner ones cloven at the end."—Gathered in Guiana by M. Martin. *Branches* round, clothed when young with rusty-coloured velvet down. *Footstalks* very short, callous. *Leaves* six or eight inches long, two broad, entire, abruptly pointed; scarcely tapering at the base; their lateral ribs alternate, all terminating in one which runs parallel to the margin: when young they are clothed beneath with reddish velvet pubescence; as are also the very short *flower-stalks*. *Flowers* large. Segments of the *calyx* three or four lines long, ovate, coriaceous, downy at the outside only. *Petals* six, obovate, nine or ten lines long, coriaceous, silky on both sides with close-pressed whitish hairs; rather contracted at the base: three outer ones rather the smallest, entire; three inner divided at the point, one segment very rarely again cloven. Outer row of the *stamens* abortive, coriaceous, oblong, brown, smooth, rather longer than the perfect ones, and lying over them, with two internal furrows at the end. *Germens* very densely crowded, scarcely distinct. *Fruit* unknown. The author doubts whether this species ought not to constitute a genus by itself.

VUBARANA, in *Ichthyology*, the name of an harengiform fish, caught in the American seas.

It resembles in figure our river trout. Its body is very nearly of the same thickness all the way, but it is elevated a little on the back, and somewhat slender just near the tail. It grows to a foot in length, and to six inches in thickness. It is a very well-tasted fish, and is generally dressed with the scales on, they being not offensive in eating. Margraave's History of Brasil.

UVEA, in *Anatomy*, the posterior surface of the iris. See Eye.

It is called *uvea*, on account of its resembling the figure and colour of a grape, called by the Latins *uva*. For which reason, also, some have given it the name of *aciniformis*, from *acinus*.

UVEDALIA, in *Botany*, received its name from Mr. R. Brown, in memory of —— Uvedale, LL.D., the friend and fellow-collegian of Plukenet (see that article), who resided at Enfield, where he had a botanic garden, on the old walls of which, if we are rightly informed, the *Hieracium murorum*, from the north, is naturalized, and still remains. His herbarium makes a part of the botanical collections in the British Museum, but we have no particulars of his domestic or personal history. We only know by tradition that his name was popularly pronounced *Oodle*. Petiver established, under the appellation of *Uvedalia*, a syngenesious genus, now sunk in Polymnia (see that article), from which the synonym *Tetragonotheca*, Linn. Gen. 438, should be erased.—Brown Prodr. Nov. Holl. v. 1. 440.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*, Linn. *Scrophulariæ*, Juss. *Scrophularinæ*, Brown.

Eff. Ch. Calyx prismatic, five-toothed. Corolla ringent: upper lip two-lobed; lower three-cleft; its middle segment rather dissimilar, with two prominences at the base. Anthers with divaricated lobes. Stigma flattened. Capsule covered by the permanent calyx, of two cells and four valves: the partition from the inflexed margins of the valves, inserted into the central receptacle.

A genus of herbaceous plants, with opposite *leaves*. *Flower-stalks* axillary and terminal, single-flowered, without *bracteas*. *Corolla* blue. Mr. Brown himself suspects it may be scarcely distinct, in reality, from Mimulus. (See that article.) He mentions no other species than one from New Holland, the rest, whatever they may be, are, we presume, natives of other countries; perhaps of the East Indies.

1. U. *linearis*. Linear Uvedalia. Br. n. 1.—"Leaves linear, several times shorter than the flower-stalks."—Gathered by Mr. Brown in the tropical part of New Holland.

This genus being confessedly very near *Mimulus*, we have not attempted to draw up its natural characters at full length.

UVELEN, in *Geography*, an island of Russia, in the Frozen sea; 12 miles N. of Cape Tchukotskoi. N. lat. 66° 25′. E. long. 188° 44′.

UVELKA, a river of Russia, which runs into the Tobol.

UVELSKAIA, a fort of Russia, in the government of Upha; 56 miles W.S.W. of Tcheliabinsk.

Uvelskaia, *Nizsnei*, a fort of Russia, in the government of Upha, on the Uvelka; 28 miles S.S.W. of Tcheliabinsk.

VUERTIER, a town of France, in the department of Mont Blanc; 10 miles S.S.E. of Annecy.

VUESCIKER, a town of Norway, in the province of Christiania; 32 miles E. of Christiania.

VUKA, a river of Sclavonia, which runs into the Danube, 8 miles N.W. of Illok.

VUKOLANI, a fortress of China, in Chen-si; 27 miles N. of Han-tchong.

VUKOVITZA, a town of Sclavonia; 8 miles W. of Verovitza.

VULCAN, in *Mythology*, the son of Jupiter and Juno, who, on account of his deformity, was cast down from heaven into the island Lemnos, and breaking his leg with the fall, is always represented as lame. At Lemnos he set up the trade of a smith, and taught the Lemnians, in recompence of the succours they afforded him, the manifold uses of fire and iron: he is also represented as the manufacturer of Jupiter's thunder, and the arms of the other gods. The poets describe him as blackened and hardened from the forge; with a face red and fiery, whilst at his work; and tired and heated after it.

This poor god is almost always the subject either of pity or of ridicule. He is the great cuckold of heaven; and his lameness serves to divert the gods. The great celestial deities seem to have admitted Vulcan among them merely to make them laugh, and to be the butt of the whole company. Spence's Polymetis, p. 81.

Cicero mentions three other Vulcans: one the son of Cœlum; the second the son of the Nile, acknowledged by the Egyptians as their protector, and called Opas; and the other the son of Menalius, who inhabited the Vulcanian isles. Banier mentions another Vulcan, more ancient than either of these, *viz.* the Tubal-Cain of scripture, who, having applied himself to the forging of iron, as Moses informs us, became the model and original of all the rest. The Vulcan of the Greeks was the god of blacksmiths, and a blacksmith himself; accordingly Diodorus Siculus (lib. v.) gives this account of him: Vulcan is the first founder of works in iron, brass, gold, and silver; in a word, of all fusible materials. He also taught the uses to which the artists and others can employ fire; and for this reason all those who work in metals, or rather men in general, call fire by the name of Vulcan, and offer sacrifices to that god, in acknowledgment of so useful an invention. The second Vulcan above mentioned, or the son of Nilus, was probably an ancient Egyptian king; or rather he was the most ancient divinity of the Egyptians, since we find him in Herodotus, Syncellus, and other authors, at the head of the divinities of these people, unless we revert backwards to Tubal-Cain, or to some one of the kings of those countries, who signalized himself in the art of forging iron.

Vulcan, the son of Jupiter and Juno, is supposed to have been a Titan prince, the same, according to sir Isaac Newton, with Thoas, king of Lemnos, whose wife had an intrigue with Bacchus, and the husband soon discovering it, Bacchus contrived to appease him by causing him to drink wine, and creating him king of Byblos and Cyprus; after which he passed the Hellespont with his army, and conquered Thrace. To these events the poets are thought to allude, when they feign that Vulcan fell from heaven into the island of Lemnos, and that Bacchus, after having pacified his wrath, succeeded in recalling him to heaven. He fell, it is said, from the heaven of the gods of Crete, when he departed from Crete to Lemnos to forge medals; he was reinstated in heaven, when Bacchus made him king of Byblos and Cyprus; for the courts of the princes of those times, in imitation of that of Jupiter, were looked upon as heaven. Newton's Chronology.

As the island of Lemnos was very subject to earthquakes and volcanoes, or as the art of forging arms was invented in this island, Vulcan is represented as falling into it. The forges of this god were also established in Mount Ætna for the same reason, and in the Vulcanian islands.

Of

Of all the ancient nations, the Egyptians were the principal worshippers of this god. Accordingly he had at Memphis a magnificent temple, and a coloſſal ſtatue, ſeventy-five feet high. His prieſts were much eſteemed by the Egyptians, ſo that one of them, named Sathos, aſcended the throne. This god was alſo highly honoured by the Romans. Tatius is ſaid, by Dionyſius of Halicarnaſſus, to have erected for him a temple, and Romulus conſecrated to him a chariot of braſs drawn with four horſes. His ſacrifices were holocauſts: and Tarquin the elder, after the defeat of the Sabines, burned their arms and ſpoils in honour of this god. The lion was, who ſeems to dart fire from his mouth, conſecrated to Vulcan; and dogs were ſet apart for guarding his temples. Of theſe he had ſeveral in Rome, but the moſt ancient one, built by Romulus, was without the bounds of the city; the Augurs being of opinion, that the god of fire ought not to be within the city itſelf. But the higheſt token of reſpect rendered by the Romans to this god, according to Dion. Halic. was their holding in his temple thoſe aſſemblies, where the moſt important affairs of the republic were debated; the Romans thinking that they could invoke nothing more ſacred, for the confirmation of their deciſions and treaties, than the avenging fire of which that god was the ſymbol. All men in general, ſenſible of their obligations to this god for the diſcovery of the various uſes which artiſts and others make of fire, offered ſacrifices to him. There were alſo feſtivals inſtituted in honour of Vulcan, of which the principal was that, at which it was the cuſtom to run with lighted torches, that were to be carried to the goal without being extinguiſhed, under pain of diſgrace; and Pliny informs us, that he who embraces another had his torch for his reward. Moſt of the medals of the iſland of Lemnos repreſented this god, with the legend, "Deo Vulcano." The Gauls paid adoration to this god 150 years before Julius Cæſar entered into their country.

VULCANALIA, among the *Romans*, a feſtival in honour of Vulcan, which was kept, as ſome ſay, from the 23d to the 29th of Auguſt, or, according to others, on the 10th before the calends of May, or the 22d of April. On this occaſion the people uſed to throw animals into the fire.

VULCANI Insula, in *Ancient Geography*, an iſland near that of Sicily, conſecrated to Vulcan, according to Diodorus Siculus. Strabo calls it the temple of Vulcan, and Virgil denominates it the houſe and territory of Vulcan. It was under this name that the Lipari iſlands were deſcribed, and they were alſo named the iſles of Œolus. Thus Virgil ſays, Æneid. l. viii. v. 416.

> "Inſula Sicanium juxta latus, Œoliumque
> Erigitur Liparea fumantibus ardua Saxis.
> * * * * *
> Vulcani domus, et Vulcania nomine tellus."

VULCANIÆ, the name of the Œolian iſle where Vulcan's forges were erected. See Lipari, &c.

VULCANO and Vulcanello, in *Geography*. Vulcano is one of the Æolian iſles ſituated to the ſouth of Lipari. Vulcanello was formerly a ſmall iſland near Vulcano, but is now joined to it by the matter ejected from a volcano, which has been continually burning in Vulcano ſince the earlieſt records of hiſtory, though in modern times the violent eruptions are leſs frequent. Vulcano has been eſtimated to be twelve miles round; but, according to the account of it given by lieutenant-general Cockburn, the circuit of this iſland is about nine miles. The ſide of the iſland which looks towards Lipari is entirely barren, and does not produce any kind of vegetable; but the other ſides, which front the weſt and the ſouth, are partly covered with the ilex and the oak, beſides quantities of broom and other ſhrubs. As the whole of the iſland is compoſed of volcanic ſubſtances, it may be inferred that thoſe parts which ſupport vegetation have been more ſubject to decompoſition than the barren parts. The ſubſtances, of which the ſoil is compoſed in the fertile parts of the iſland, are lavas ſoftened to a great depth by atmoſpheric agency. On removing this ſoil, Spallanzani found the ſubjacent lava hard and porphyritic. Mixed with the lava were large pieces of obſidian, ſimilar to that of Lipari. Vulcano is not inhabited, but is viſited by ſportſmen from Lipari, who go there to ſhoot rabbits. The firſt account we have of Vulcano is given by Thucydides, who relates, in his hiſtory, that Vulcano threw out flames by night and ſmoke by day. Ariſtotle, in his Treatiſe on Meteors, deſcribes an ancient eruption of Vulcano, a part of the ground ſwelled and roſe with a great noiſe, forming a hill which burſt, and from whence a violent wind iſſued forth, with flames. At the ſame time ſo great a quantity of aſhes were thrown out, as entirely to cover the neighbouring city of Lipari. The eruptions of Vulcano were viſible in his time.

Polybius, as quoted by Strabo, ſays there were three volcanoes in this iſland, two well defined, and one with the crater partly fallen in. The mouth of the larger was five ſtadia in circuit. The bottom was only fifty feet in diameter, and ſituated about one ſtadium above the level of the ſea. The form of the other two craters were ſimilar. At a later period, in 1726, there were two burning craters on this iſland. See Volcano.

From the text of Strabo, it may be inferred, that the volcanoes in this iſland threw out lava, ſince he ſays the burning matter ejected filled up a part of the ſea to a conſiderable extent. Callias, in his life of Agathocles, tyrant of Syracuſe, relates that, on a lofty eminence of Vulcano, there are two craters, one of which was three ſtadia in circumference, caſting a great light to a vaſt diſtance, and that from this mouth burning ſtones of great ſize were thrown out, with ſo loud a noiſe that it might be heard to the diſtance of 500 ſtadia.

Cluverius and Fazello, in more recent times, deſcribe Vulcano as being in a ſtate of active eruption. The ſmall iſland of Vulcanello, which now joins Vulcano, roſe from the ſea about the year of Rome 550. It was ſeparated from Vulcano by a very narrow ſtrait, which was open in the time of Fazello, but afterwards filled up by new eruptions from Vulcano.

At preſent there is only one burning crater on Vulcano, from which there have been two conſiderable eruptions in modern times, the one in 1775, the lateſt in 1786, which threw out an immenſe quantity of ſand mixed with volumes of ſmoke and fire, accompanied with ſubterranean noiſes and thunders. This eruption continued for fifteen days, and appears to have changed the form and depth of the crater. See Volcano.

The preſent crater of Vulcano nearly equals in ſize that of Veſuvius, and greatly exceeds it in the variety of productions with which the ſides are lined. Theſe preſent the moſt beautiful colours, red, orange, deep yellow, and green. They conſiſt of ſulphur in various ſtates of combination, and of ſaline and metallic matter and volcanic glaſſes. (See Volcano and Volcanic *Products*.) About half way down the crater, a hot ſpring iſſues from the ſide; but the quantity of water which flows is ſmall, and is ſoon loſt among the maſſes of ſcoriæ and lava. Above the ſpring are pendant ſtalactites of alum of various forms and ſizes. The height of the ſummit of the crater of Vulcano is not given by any traveller

that we are acquainted with; but from a comparison with Stromboli, it can scarcely be estimated at more than 1500 feet above the level of the sea. The sand on the shore, in some parts of the island, though covered with the sea, preserves a certain degree of heat.

The ancients attached much importance to the appearance of the smoke of Vulcano. They inform us, that before a south wind blew, the island was enveloped in so dark a cloud, that Sicily could not be seen from it. When a north wind was to be expected, a pure flame rose above the crater. The various sounds of the explosions likewise, and the different places where the eruptions began, with the appearance of the flames, were all prognostics of the wind which would blow three days afterwards. This account, given by Polybius, does not accord with the present phenomena of Vulcano; and in all probability, it originated not in any accurate observations, but from the prejudices of ancient mariners.

Modern observers have also pretended to predict the state of the weather from the appearance of Vulcano. If it could be established that there was any connection between the state of the atmosphere, and the intensity of the volcanic fire, the fact would be well deserving attention. It is however necessary to observe, that the smoke and vapour from common fires and breweries, &c. assume a very different appearance in different states of the atmosphere, and that this should be the case with the vapour and smoke issuing from volcanoes appears highly probable, without allowing that any real change takes place in the volcano itself. In a book entitled "Tracts by Sicilian Authors," printed at Palermo in 1761, there is a dissertation on the manner in which the weather may be foretold twenty-four hours before hand, in which the following account is given by a native of Lipari, who made his observations between the years 1730 and 1740. "The change of weather and winds is indicated by mount Vulcano twenty-four hours before it takes place, by a louder noise than usual, resembling distant thunder, and if we then observe the smoke that issues in a greater quantity than usual, we may discover what kind of wind will succeed. When the wind is about to change to the south-east, the smoke rises so dense and black, and in so great a quantity, and to such a height, and afterwards falls in so black a dust, as to strike the beholder with awe. At the same time a loud roaring is heard, frequently accompanied with tremblings of the earth. When the wind is on the point of changing to the north-north-east, or north-north-west, or north-west, the smoke rises more slowly, is less dense, and the colour is entirely white, as is that of the dust which falls from it. Nor does any loud noise or trembling of the earth take place. When the wind is about to change to the east, or east-north-east, an explosion is heard in the body of the mountain, which soon after throws out a little white smoke, of which colour are likewise the ashes which fall when the smoke is dispersed. The mountain in the mean time explodes, and roars so violently at intervals, that the shock of an earthquake is dreaded. Lastly, previous to a change of wind to the west, the west-south-west, or west-north-west, vast volumes of smoke arise of a dark ash-grey, approaching the colour of lead, and so thick that when they disperse they occasion a continued shower of ashes."

These observations, whether correct or not, indicate a more active state of the volcano than what it presents when it has recently been visited. Spallanzani, who notices the above predictions relative to Vulcano, says, "I should justly incur the imputation of rashness were I absolutely to deny these facts, without having sufficient reason so to do, especially as they are so precise, and are said to have been observed on the spot. Besides, it does not appear credible that Abbate Rossi, who gives them, would have published his observations in a place where he was liable to be contradicted by all his countrymen. I must, however, with philosophic candour, say, that during my residence of several weeks in Lipari, where I continually saw Vulcano during the blowing of the different winds mentioned in this extract, particularly the south-east, the west, and the south-west, I never observed, either before they begun, or while they continued to blow, any tremblings of the earth, subterranean roarings, lofty columns of smoke, or showers of ashes. Once only, when a violent south-west wind was on the decline, the column of smoke which issued from Vulcano increased prodigiously, but when it had risen a little distance above the upper edge of the crater, it grew thinner, and soon after vanished. Though the wind continued to blow, this prodigious cloud of smoke still continued to rise from the crater for several hours. I once observed the smoke to be exceedingly rare when a strong west wind blew; and twice, when the air was perfectly calm, I observed the smoke extremely copious, and rising to a great height. To conclude, after carefully noticing day by day every change that took place in the phenomena exhibited by Vulcano, during my stay in its vicinity, I could perceive none which afforded support to these famous prognostics. The sailors at Lipari also were not agreed respecting them. I am not, however, so positive as to deny the whole of these observations. To know with certainty whether any direct relations exist between the various symptoms of Vulcano, and the changes of the atmosphere, it would be necessary to reside for some years in the island, a place truly wild and desolate; and he who, like Empedocles at Etna, should go to erect his dwelling there, in order to observe the changes of the volcano, would have no other companions than the rabbits which make their burrows in the southern side of the island." Spallanzani's Travels in the Two Sicilies, vol. ii.

When M. de Luc visited Vulcano in 1757, it appeared to be in a more quiescent state than at present; for though smoke and vapour issued from the crater, he does not mention being incommoded by the heat when he descended into it. Yet he noticed a fact which we believe has not since been remarked. The sulphureous vapours had a communication with the sea, which was in many places of a yellowish colour, and in others emitted fumes; and in the places where the fumes issued, the heat was intolerable, so that the fish which approached the coast died, and the beach near the level of the sea was covered with dead fish. Pliny states, that when the island of Vulcanello was thrown up, a great number of fish were found dead, and caused the death of those who ate them.

An opinion exists, and has existed for centuries, that the ground under Vulcano is hollow, and that it will some time be swallowed up. This opinion probably originated from the hollow sound occasioned by the throwing of a stone, or any hard substance, on the bottom of the crater. Probably Vulcano, Stromboli, and all the Æolian isles, are only the chimneys of one immense subterranean fire, extending under the whole, and communicating from thence to Etna and Vesuvius. Stromboli threw out unusually dense and suffocating volumes of smoke for some days before the earthquakes which desolated Calabria in 1783; and was uncommonly violent at the time of the great earthquake which destroyed Euphemia. See Volcano.

VULDEP, a river of Bavaria, which runs into the Inn, near Ratenburgh in the Tyrolese.

VULGAGO, a name given by some botanical authors to the asarum or asarabacca, whose leaves and root are used in medicine.

VULGAR *Arithmetic, Fractions*, and *Purgation*. See the substantives.

VULGATE, a very ancient Latin translation of the Bible; and the only one the church of Rome acknowledges to be authentic.

The ancient Vulgate of the Old Testament was translated, almost word for word, from the Greek of the Septuagint. The author of the version is not known, nor so much as guessed at. See VERSION, *Italic* and *Latin*.

It was a long time known by the name of the *Italic*, or old version; as being of very great antiquity in the Latin church. It was the common, or vulgar version, before St. Jerom made a new one from the Hebrew original, with occasional recurrences to the Septuagint; whence it has its name *Vulgate*.

Nobilius, in 1558, and F. Morin, in 1628, gave new editions of it; pretending to have restored, and re-collated it, from the ancients who had cited it. The Vulgate was held, by St. Augustine, to be preferable to all the other Latin versions then extant; as rendering the words and sense of the sacred text more closely and justly than any of the rest. It has since been retouched from the correction of St. Jerom; and it is this mixture of the ancient Italic version, and some corrections of St. Jerom, that is now called the Vulgate, and which the council of Trent has declared to be authentic.

It is this Vulgate alone that is used in the Romish church, excepting for some passages of the ancient Vulgate left in the Missal, and the Psalms; which are still sung according to the old Italic version.

St. Jerom declares that, in his revisal of the Italic version, he used great care and circumspection, never varying from that version but when he thought it misrepresented the sense. But as the Greek copies to which he had access were not so ancient as those from which the Italic version had been made, some learned authors have been of opinion that it would have been much better if he had collected all the copies, and by comparing them, have restored that translation to its original purity. It is plain that he never completed this work, and that he even left some faults in it, for fear of varying too much from the ancient version, since he renders in his commentaries some words otherwise than he has done in his translation. This version was not introduced into the church but by degrees, for fear of offending weak persons. Rufinus, notwithstanding his enmity to St. Jerom, and his having exclaimed much against this performance, was one of the first to prefer it to the Vulgar or Italian. This translation gained at last so great an authority, by the approbation of pope Gregory I. and his declared preference of it to every other, that it was subsequently in public use through all the Western churches, although it was not regarded as authentic, except by the council of Trent: it is certainly of considerable use, as it may serve to illustrate several passages both of the Old and New Testament.

The two principal Popish editions of the Vulgate are those of popes Sixtus V. and Clement VIII. The former was printed in 1590, after pope Sixtus had collected the most ancient MSS. and best printed copies, summoned the most learned men out of all the nations of the Christian world, assembled a congregation of cardinals for their assistance and counsel, and presided over the whole himself. This edition was declared to be corrected in the very best manner possible, and published with a tremendous excommunication of every person, who should presume ever afterwards to alter the least particle of the edition thus authentically promulgated by his holiness, sitting in that chair, *in qua Petri vivit potestas, et excellit auctoritas*. The other edition was published in 1592, by pope Clement VIII.; which was so different from that of Sixtus, as to contain two thousand variations, some of whole verses, and many others clearly and designedly contradictory in sense; and yet this edition is also pronounced authentic, and enforced by the same sentence of excommunication with the former. See Kennicott's State of the printed Hebrew Text, &c. vol. ii. p. 198, &c.

VULGATE *of the New Testament*. This the Romanists generally hold preferable to the common Greek text, because it is this alone, and not the Greek text, that the council of Trent has declared authentic: accordingly that church has, as it were, adopted this edition, and the priests read no other at the altar, the preachers quote no other in the pulpit, nor the divines in the schools.

Yet some of their best authors, F. Bouhours for instance, own, that among the differences that are found between the common Greek and the Vulgate, there are some wherein the Greek reading appears more clear and natural than that of the Latin; so that the second might be corrected from the first, if the holy see should think fit. But those differences, for the generality, only consist in a few syllables, or words; they rarely touch the sense. Besides, in some of the most considerable, the Vulgate is authorized by several ancient manuscripts. Bouhours spent the last years of his life in giving a French translation of the New Testament, according to the Vulgate. In 1675, a new edition of the Greek Testament was published by the university of Oxford; and great care taken therein to compare the common Greek text with all the most ancient manuscripts in England, France, Spain, and Italy; and to note the differences observed therein.

In the preface of this work, the editors, speaking of the divers versions of the Bible in the vulgar tongues, observe of the Vulgate, that there is no version of any language to be compared with it. And this they justify, by comparing passages that occur in the most celebrated Greek manuscripts, with the same passages in the Vulgate, where there is any difference between that and the common printed copy. In effect, it is probable, that at the time the ancient Italic or Vulgate version of the New Testament was made, and at the time it was afterwards compared with the Greek manuscripts by St. Jerom, as they were then nearer the times of the apostles, they had juster Greek copies, and those better kept, than any of those used when printing was first set on foot.

"Highly as the Vulgate is extolled by the church of Rome," says professor Michaelis, "it has been depreciated beyond measure at the beginning of the 16th century by several learned Protestants, whose example has been followed by men of inferior abilities. At the restoration of learning, when the faculty of writing elegant Latin was the highest accomplishment of a scholar, the Vulgate was regarded with contempt, as not written with classical purity. But after the Greek manuscripts were discovered, their readings were preferred to those of the Latin, because the New Testament was written in Greek, and the Latin was only a version; but it was not considered that these Greek manuscripts were modern in comparison of those originals from which the Latin was taken; nor was it known at that time, that the more ancient the Greek MSS. and the other versions were, the closer was their agreement with the Vulgate. This has been already evinced by Simon, who made it a particular object of his attention in his 'Hist. Crit. du Texte et des Versions du N. T.,' and has pointed out the real merits of the Latin version. Our ablest writers, such as Mill and Bengel, have been induced by this treatise

to abandon the opinion of their predecessors, and have ascribed to the Vulgate a value perhaps greater than it deserves." Michaelis's Introduction to the New Testament by Marsh, vol. ii. part 1. Campbell's Prelim. Dissertation to his Comment on the Four Gospels. A complete account of all the editions of the Vulgate is given in Le Long Bibl. Sacra, ed. Masch. part 2. vol. iii. cap. 2.

M. Simon calls the Greek version of the Septuagint, before it was revised and reformed by Origen, *the ancient Vulgate Greek*. Origen's correction was preferred to the ancient Greek, which was consequently disused; so that we have now scarcely any copies of it. See SEPTUAGINT.

VULGIENTES, in *Ancient Geography*, a people of Gallia Narbonnensis, N. of the Salgii; to whom Pliny assigns the town of Apta Julia.

VULKAN, in *Geography*, a mountain of Transylvania; 24 miles W. of Weissemburg.

VULNERARY, formed from *vulnus*, *wound*, in *Medicine*, an epithet given to remedies proper for the cure of wounds and ulcers.

There are divers vulnerary herbs; as aristolochia, or birth-wort; sanicle, or self-heal; plantain, mouse-ear, veronica, or fluellin; agrimony, vervain, or the holy herb, &c.

There are also vulnerary potions, composed of various simples; vulnerary balsams, unguents, plasters, &c. See BALSAM, &c.

VULNERARY *Water*. See WATER.

VULPANSER, in *Ornithology*, a name given by some authors to the shell-drake, or borrow-duck, a very beautiful species of duck, common on some of our coasts, and called by the generality of authors *tadorna*. See DUCK.

VULPECULA, in *Ichthyology*, a name given by Bellonius and Gesner to the fish called by the generality of authors *centrine*. See CHIMÆRA and SQUALUS.

VULPECULA *et Anser*, *Fox and Goose*, in *Astronomy*, a constellation made out of unformed stars by Hevelius, in which he reckons twenty-seven stars; but Flamstead enumerates thirty-five. See CONSTELLATION.

VULPES, in *Entomology*, a species of SCARABÆUS, which see.

VULPES, in *Zoology*. See FOX.

VULPES *Bahamensis*, in *Ichthyology*, a species of ESOX, with a fin in the middle of the back, and the branchiostegous membrane three-rayed. It is found in America.

VULPES *Marina*. See *Sea*-FOX.

VULPES *Putoria*, in *Zoology*. See DIDELPHIS *Opossum*.

VULPINALIA, among the *Romans*, a feast celebrated on the 19th of April, in which they burned foxes.

VULSINIENSIS LACUS, or *Vulsinian Lake*, in *Ancient Geography*, a lake of Italy, in Etruria, nearly S. of the lake of Trasimené. It took its name from that of *Vulsinii*, which see. See also VOLSINENSIS *Lacus*.

VULSINII, *Bolsena*, a town of Italy, in Etruria, upon the northern bank of the lake above-mentioned. It was one of the most considerable towns of Etruria; and its inhabitants armed themselves against the Romans in the year of Rome 363. This town afterwards fell under the power of slaves; but when they were introduced into the order of senators, they would not suffer any assembly to be convened without their consent, and they asserted their own impunity for many crimes which entailed dishonour on families. This singular fact occurred in the year 489. According to Florus, these slaves were under the conduct of a person named Fabius Gurgites. The Romans established the order in Vulsinii; but they despoiled it of a great number of statues. This town was ravaged at three different times: first by the Romans; then by a monster, of whom no adequate idea can easily be given; and lastly, by a thunderbolt.

VULSON, MARC DE, *Sieur de la Colombière*, in *Biography*, an heraldic writer, lived at Grenoble in 1618, and discovering his wife in the act of adultery, killed her and her gallant, and obtained a pardon at Paris, whither he fled. His work, entitled "La Science Heroique, traitant de la Noblesse, de l'Origine des Armes, &c." 1644, folio, reprinted with additions in 1669, is reckoned the most complete French work on Heraldry. He also published, "Le Theatre d'Honneur et de Cavalerie, ou le Miroir Historique de la Noblesse," 2 vols. folio, 1648, and "Recueil de plusieurs Pièces et Figures d'Armoiries," folio, 1689: and died in 1658 Nouv. Dict. Hist.

VULTONA, *La Boutonne*, in *Ancient Geography*, a river of Aquitania in Gaul; after pursuing the course nearly from E. to W., it discharges itself into the Charante. This river is also denominated "Vultumna."

VULTUR, or VULTURE, in *Ornithology*, a genus of birds belonging to the order of Accipitres, or hawks. The characters of which are, that the bill is straight, and hooked only at the apex, and covered at the base by a cere or skin; that the head has no feathers, and covered in front with a naked skin; that the tongue is fleshy, and generally bifid, the neck retractile, and the feet strong, with moderately crooked claws. Gmelin, in his edition of the Linnæan system, reckons 13 species, besides varieties, which are as follow:

GRYPHUS, or Vulture *Condor*, or largest vulture, or black vulture, with the shorter wing-feathers white; the head furnished with an upright, compressed, fleshy crest or comb; the throat naked and red; and the neck carunculated on each side. We are enabled, by Dr. Shaw, who had an opportunity of examining two birds of this kind in excellent preservation in the Leverian Museum, to give a more correct description of this genus than that which was furnished when the article condor was written. (See CONDORE.) These birds, which are more frequently seen in Peru than in any other parts of South America, were brought from the straits of Magellan. They were supposed to be male and female. The male bird has "a kind of gular pouch, or large dilated skin, of a blueish colour, proceeding from the base of the lower mandible, and reaching to some distance down the neck. On each side of the neck is also situated a row or series of flat, carneous, semicircular, or ear-shaped flaps or appendages, to the number of seven on each side, and which gradually decrease in size as they descend; being so disposed as to lap slightly over each other. The whole neck and breast are of a red colour, and perfectly bare of feathers; being only coated here and there with a few straggling filaments of blackish hair or coarse down. The colour of the lateral wattles or carunculæ inclines to blueish. The crest or comb on the head is large, upright, thick at the base, sharpened on its edge, and not entirely even in its outline, but somewhat sinuated, sinking slightly in the middle, and rising higher on the back part: it is smooth, and irregularly convex on the sides, and in its texture or substance not greatly dissimilar to that of the V. papa of Linnæus, or king vulture. At a slight distance behind this, on each side, is situated a much smaller, semi-oval nuchal crest, of a similar substance, and beset with coarse down. The colour of the crest is blackish, slightly inclining to red and blue in some parts. Towards the lower part of the neck is a pendent pear-shaped tubercle: the lower part of the neck is surrounded by a collar of milk-white down or fine plumes, representing exactly a tippet of white fur. The extent of the bird, from wing's end to wing's end, was said to

to be more than twelve feet when measured immediately after it was shot."

The back of the bird has been erroneously described as white, whereas it is coal-black; an error evidently owing to the bird's having been seen with the wings closed over the back, so that the white secondaries covered it from view. Gmelin copied this error from Molina, and thus Mr. Latham was misled. In their descriptions, the tail is said to be small, which, on the contrary, is rather large in proportion to the bird. The supposed female had not the least appearance of a comb on the head, which, with some other particulars, inclined Dr. Shaw to conclude that it was either a young bird or a female. The extent of its wings from tip to tip was not far short of 10 feet. Another of these birds, mentioned in the 18th volume of the Phil. Transf. and shot in Chili, had wings which extended more than 16 feet. The beak of the fore-mentioned female was of a dark lead colour, becoming gradually whitish towards the tip. The head and neck were destitute of feathers, but covered with a short straggling sort of hairy down; the top of the head inclined to a dark colour, but the rest of the neck was paler, and probably in the living bird of a reddish colour. Towards the lower part of the neck, where it joins to the shoulders, was a ruff or circle of white downy feathers; and beneath the breast a considerable bare space: the rest of the bird was black, except the shorter or secondary wing-feathers, which were white with black tips: the legs and feet were blackish, very strong, but the claws not much incurvated: the tail even at the end, and very slightly rounded at the sides. On comparing the remiges or wing-feathers of this bird with some of those which were brought over by Mr. Byron as those of the real condor, Dr. Shaw found them to be exactly similar, except in size. From an examination of these specimens, Dr. S. concluded that the physiognomy of this bold and formidable vulture is not of a ferocious cast, but rather exhibiting an appearance almost bordering on mildness. M. Humboldt makes some deduction for the alleged size of this bird, as he had seen none which exceeded 3 feet 3 inches in length, and 8 feet 9 inches in extent from the end of one wing to that of the other. He admits, however, that the condor may sometimes be supposed to arrive at a much greater magnitude, and to measure in extent of wings 11 or 12 feet. Its usual residence, as he informs us, is among lofty rocks in the region of the Andes, just below the boundaries of perpetual snow, and it may be considered as a co-inhabitant with the guanaco.

Nothing can exceed the sagacity with which the condor perceives the scent of its prey at a distance, or the boldness with which it flies down to seize it. It preys both on dead and living animals, and two birds will seize on a heifer, and begin their work of destruction by picking the eyes and tearing the tongue out.

A method of taking condors alive is often practised in Peru and Quito, and is as follows: — A cow or horse is killed; and in a little time the scent of the carcase attracts the condors, which are suddenly seen in numbers in places where no one would suppose they existed. They always begin with the eyes and tongue, and then proceed to devour the intestines, &c. When they are well sated, they are too heavy and indolent to fly, and the Indians take them easily with nooses. When thus taken alive, the condor is dull and timid for the first hour, and then becomes extremely ferocious. M. Humboldt had one in his possession for some days, which it was dangerous to approach. The condor is extremely tenacious of life, and will survive for a long time such wounds as might be supposed to prove immediately fatal; and such is the fulness of its plumage, that it has the power of resisting or repelling the force of a ball fired at it from a gun. This indeed is not peculiar to the condor, but has been observed in some other well-feathered and thick-skinned birds, particularly those of the order *Anseres*.

Bengalensis, the Brown Vulture. With the head and neck naked before, and faintly chesnut-colour; the bill lead colour, with black tip; or brown vulture, paler beneath, with the head and neck covered by fuscous down; the lower part encircled by a brown ruff. This is the Bengal vulture of Latham, two feet six inches in length; bill and legs dusky black, and crop hanging over the breast, as is the case in many others of the vulture tribe. It is a native of Bengal.

Papa, Vulture. With carunculated nostrils, and naked crown and neck; or whitish-rufescent vulture, with naked variegated head and neck; nostrils furnished with a loose orange-coloured caruncle, and neck with a grey ruff. This is the cozcaquauhtli of Hernand. Mex., king of the vultures of Edwards, and exceeds every other species in the elegance of its appearance, about the size of a hen turkey, and of a light-reddish brown or buff colour, with black wings and tail, accompanied with a gloss of green, the edges of the wing-feathers being of a whitish cast; the under parts of the body are white, with a slight cast of yellow; the legs and feet pale flesh-colour; but what constitutes the peculiar ornament of the bird is the vivid colouring of the head and neck, which are bare of feathers. This beautiful species is a native of many parts of South America, and is also found in the West Indies; it feeds on carrion, like the rest of the tribe, and occasionally preys on several of the smaller animals, as lizards, &c.

Monachus, Monk Vulture. With gibbous crown, and black body; or brown vulture, with lengthened ruff, and downy occipital crest. This is the crested black vulture of Edwards; the cinereous or Arabian vulture of Latham; and vautour, or grand vautour of Buffon. This bird is an inhabitant of the deserts of Arabia, and is said to be not uncommon in the Pyrenean mountains.

Aura, the Brown-greyish Vulture. With black wing-feathers, and white bill; or blackish vulture, with purple and green reflexions, and red, naked, papillated and wrinkled head and neck. This is the tzepilotl of Hernandez; the uruba, &c. of Willughby and Marcgrave; the gallinazo of Ulloa; the turkey-buzzard of Catesby; and the carrion-crow of Sloane; the carrion-vulture of Pennant and Latham; and vautour de Brasil of Buffon. Some say that there are two distinct species, viz. the V. aura, which is of a blackish-brown, and the V. uruba, which is entirely black, the bill, head, and neck excepted, which latter is most prevalent in South America. Gmelin mentions a variety, black, with brown wing-feathers, and cinereous bill. This species, with some variations, appears to be generally diffused over the whole continent of South America, but mostly in the warmer regions. In some parts of British America it is popularly called the turkey-buzzard, and in other parts carrion-crow. It is somewhat smaller than a turkey; it feeds on every kind of animal matter, and is highly esteemed in the West Indies on account of its activity in clearing away substances that might otherwise render the air noxious in those warm climates. In consequence of this mode of life, the birds themselves have always a very offensive odour. According to Mr. Pennant, these birds are common from Nova Scotia to Terra del Fuego, and though they are mischievous in attacking and destroying cattle in a weak or diseased state, they are beneficial in lessening the number of alligators, which would otherwise become intolerable by their multitudes.

Cinereus, the Brown-blackish Vulture. With wing and tail-feathers verging towards cinereous, and legs covered with brown feathers. This is referred by Shaw to the V. monachus. It is the V. cinereus of Ray; the cinereous or ash-coloured V. of Willughby and Latham. It inhabits high mountains of Europe. Gmelin suggests it to be a variety of percnopterus.

Fuscus, the Brown Vulture. With wing-feathers brown or blackish, the primary white at the apex spotted with brown, and tail-feathers grey-brown, and naked legs. This is the vautour de Malta of Buffon, and found in Europe, chiefly in the island of Malta. Gmelin questions whether it be different from the percnopterus?

Niger, Black Vulture. With wing and tail-feathers brown, and legs covered with black feathers. This is described as larger than the golden vulture, of a black colour, and is said to be common in Egypt and Sardinia. Gmelin suggests that it is a variety of percnopterus, and Dr. Shaw also inclines to think that it is a variety.

Leucocephalus, Vulture. With snowy feathers, wing and tail black, with a white ruff. This is the white or cinereous vulture of Willughby, and the vautour de Norvege of Buffon; found in Sardinia and Norway; and suggested to be a variety.

Fulvus, Vulture. From grey to reddish above, head, neck, and ruff white, wing and tail-feathers black; or fulvous-chesnut vulture, with black wing and tail-feathers, downy whitish head and neck, and white ruff. This is the V. fulvus of Brisson, the fulvous V. and golden V. of Willughby, and le griffon of Buffon. This is one of the largest of the genus, exceeding the size of the golden eagle. The general colour of the plumage, when the bird is in its best state, is a full rufous or tawny chesnut; the legs and feet are ash-coloured. This bird, often confounded with others, is found in the mountains of Persia.

Percnopterus, Vulture. With black wing-feathers, the exterior margin, that of the outmost excepted, greyish or hoary; or white V. (the female brownish) with lengthened narrow beak, naked face, and black wing-feathers with grey edges. This is the V. (percnopterus) with naked head and plump throat, or Egyptian mountain-falcon of Hasselquist; the aquiline V. of Albin.; the vulterine eagle of Aldrovand.; and the rachamah of Bruce's Travels. Its size, according to Gesner, is that of a stork. Shaw thinks it probable, that the rachamah of Bruce, the Angola vulture of Pennant, the ash-coloured vulture of Latham, and the petit vautour or vautour de Norvege of Buffon, are in reality the same species, and constitute the male V. percnopterus of Linnæus. He also inclines to believe that the Maltese V. of Latham, or vautour de Malte of Buffon, is merely the female of this species. If this be the case, the V. percnopterus seems to be a pretty general inhabitant of the old continent, being found not only in many of the temperate and warmer parts of Europe, but in various parts of Asia and Africa. It is plentiful in Egypt, where it is esteemed for its beneficial services in destroying various putrid substances in the vicinity of towns and cities. Its general size is that of a female turkey, but in this respect it varies in different countries. The male also varies in the cast of its colour, which is sometimes nearly white, and sometimes a dirty pale rufous-white; the quills are black, but the secondaries are externally of the same colour with the rest of the plumage. The female is said to exceed the male in size. Bruce informs us, that it is a very great violation of order, or police, to kill any of these birds near Cairo.

Cristatus, the Crested Vulture. From reddish to blackish, the breast more inclining to red, the legs naked. This is the brown vulture of Willughby and Latham. It is found in thick and desert forests.

Barbarus, or Barbatus. The vulture brown to black, underneath white inclining to brown, woolly legs, lead-coloured toes, and brown nails; or blackish-brown V. subfulvous beneath, with the head and neck covered by lanceolate whitish plumes, and the bill bearded beneath. This is the bearded V. of Edwards and Latham. It is one of the largest of the European vultures, and is principally observed among the Alps of Switzerland, where it is called lammer-geyer, or lamb-vulture. It is described and figured in the works of Gesner, under the title of V. aureus. It exceeds the golden eagle in size. This species seems to be a native of the wilder regions both of Asia and Africa, and seems to be recorded by Mr. Bruce under the name of "nisser-werk." Mr. Bruce's description, for which we refer to the Appendix to his Travels, affords a striking instance of the boldness and voracity of this bird. This vulture is said to build in the inaccessible cavities of lofty rocks, and they sometimes assemble in small flocks about the mountainous regions of the countries which they inhabit.

Dr. Shaw mentions some other species, besides those that are above enumerated.

Californianus, Black Vulture. With whitish beak; head and neck unfeathered, and of a pale colour; the plumes of the collar and breast lanceolate. This bird is one of the largest of the genus, and approaches to the size of the condor. It was brought over from the coast of California, and is now in the British Museum.

Auriculatus, Brown Vulture. With naked neck, skin of the ears lengthened, and pale ruff. This is the oricou of Levaillant, and it is a very large bird, measuring ten feet from one wing's end to the other: its general colour is brown, the throat being black, and covered with coarse hairs. These birds inhabit the southern parts of Africa, and are of a gregarious nature, assembling in large flocks about the caverns of the rocky mountains, where they breed. This bird is very voracious, and when attacked or wounded defends itself with surprising strength and resolution; but it is naturally of an indolent and sluggish character.

Ponticerianus, Black Vulture. With nearly naked flesh-coloured head and neck, and a fleshy red caruncle down each side of the neck. It is the vautour royal de Pondicherry of Sonnerat, whence its name. Its size is that of a very large goose, with black bill and yellow legs; and is a native of India, particularly about Pondicherry.

Indicus, Brown Vulture. With naked, rufous head and neck, and black wing and tail-feathers. It is the Indian V. of Latham, and le grand vautour des Indes of Sonnerat. It is of the size of the preceding, and native of India, extremely voracious, principally frequenting the sea-banks, and preying upon dead fish and other putrid substances; and, like other birds of this genus, sometimes assembling in vast numbers on a field of battle.

Castaneus, Chesnut Vulture. With whitish downy head and neck, brownish ruff, and black wing and tail-feathers. This is the percnoptere of Buffon, and differs little from the fulvous vulture, so that it might be thought to be a mere variety of that species. This bird is remarkable for a brown spot shaped like a heart, and edged with a straight white line, situated on the breast under the ruff. It is deformed in figure, and disgusting in appearance, from a continual flux of rheum from its nostrils, and of saliva from two other holes in the bill. According to Buffon, it is of the size of an eagle, and an inhabitant of the Alps and Pyrenees, and of the mountains of Greece.

Ginginianus, White Vulture. With black wing-feathers,

feathers, and grey beak and legs. The vautour gingi of Sonnerat, who says it is of the size of a turkey, and is found about the coasts of Coromandel. Its flight is strong and rapid, and its voracity insatiable: it lives on carrion and reptiles; is generally seen single and in marshy places.

PLANCUS, Whitish Vulture. With transverse blackish lines, brown wings, and slightly crested black crown. This is the V. plancus of Latham, the falco plancus of Linnæus and Gmelin, the plaintive eagle and plaintive vulture of Latham. It is a native of Terra del Fuego.

CHERIWAY, Vulture. With rose-coloured cere, yellow legs, ferruginous body, and whitish head with ferruginous crest. This is a kind of doubtful species, which may be considered either as a vulture or an eagle. Jacquin first described it, after having observed it in the island of Aruba, near the coast of Venezuela in South America.

The following species are denominated by Dr. Shaw doubtful: *viz.*

Tawny Vulture of Latham, said to be a native of Falkland islands, with very short bill, large cere, and chin slightly bearded.

Hare Vulture, probably a species of eagle rather than vulture.

Armed Vulture. Mentioned by Brown in his African travels, and said to be very frequent in the country of Darfur, flying about by thousands, and devouring all kinds of carrion, &c.

Bold Vulture of Latham, so bold as to attack the natives in New Holland, where it is called "Boora Morang."

It is said that there are no vultures in Great Britain, nor any north of the Baltic; but the various species are found in the southern parts of Europe, Asia, Africa, and America, as low as Terra del Fuego. They are a sluggish ungenerous race, preying oftener on dead animals, and even on putrid carcases, than on living creatures: their sense of smelling is most exquisite: they collect in flocks from great distances; and are directed to their prey by the sagacity of their nostrils: they fly slowly and heavily; are very greedy and voracious to a proverb; and they are bold and fearless, preying in the midst of cities, undaunted by mankind. Pennant's Genera of Birds, p. 2.

The vulture was a bird consecrated to Mars and Juno; and used among the Romans in the exercise of augury.

VULTUR, *Mons*, (*Mount Vulturno*,) in *Ancient Geography*, a mountain of Italy, in Apulia, forming a chain which extends from the S.W. to the N.E. south of Venusia. We learn from Livy, that the inhabitants of the country called the wind which proceeded from this mountain Vulturnus; which wind is said to have blown in the faces of the Romans during the battle of Cannæ. But Polybius does not mention this circumstance; and it appears that the Romans were to the S., and the Carthaginians to the N., so that the faces of the former were turned towards the N. or the E. Accordingly, the wind of which Hannibal speaks, was one of the collateral winds, which the ancients called Vulturnus, and which was E.S.E.

Horace speaks of this mountain in one of his Odes (lib. iii. od. 4.); and Lucan also mentions it (lib. ix. v. 183.)

VULTURIA, or VULTURINA, a fortified place in Gallia Cisalpina, S.E. of Cremona; which surrendered to the Lombards.

VULTURIUS, among the Romans, a throw of the *tali*, otherwise called *canis*. See TALARIUS *Ludus*.

Also, an epithet given to Apollo, from a whimsical circumstance, which was that of releasing a poor shepherd, who had been deserted with stolen treasure by his companion, and left in the cavern of a rock, from which he had no means of ascending. Apollo advised him to wound his body with a flint, upon which a number of vultures, allured by the scent of blood, flocked round him, and planting their bills in his wounds and cloaths, mounted upwards with him, and delivered him from the cave. The fable further reports, that the other shepherd was sentenced to death by the Ephesian magistrates, and the survivor having received by their award half the gold which was found in the cave, and which his companion had purloined, built with it, upon the mountain where the adventure had occurred, a temple in honour of his deliverer, under the name of Apollo Vulturius.

VULTURIUS *Lapis*, a name given by many to the stone called *quandros*.

VULTURNALIA. See VOLTURNALIA.

VULTURNIA, in *Ancient Geography*, an island situated between Sicily and the coast of Africa, according to the Itin. of Auton.

VULTURNUM, a town of Italy, at the mouth of the *Vulturnus*.

VULTURNUS, (*Le Vulturno*,) a river of Italy, in Campania. It commenced towards the north, in Samnium, among the Caracenians, and for a long interval separated Samnium from Campania. At Benevento, it turned to the W., and discharged itself into the sea. Towards the sea, on the right of the river, was the territory of Falerna, on this side of mount Massicus, which was celebrated for its excellent wine; but in the time of Pliny it was neglected, and began to decline in reputation: that of the vineyard of Faustinus being more esteemed. Livy informs us, that in the second Punic war, a fort was erected at the mouth of this river, which afterwards became a town, in which was established a Roman colony. Varro gives this town the name of a colony.

VULTUS *de Luca*, the same with veronica.

VULVA, *quasi Valvæ*, *doors*, a name which some physicians give to the vagina, and others to the uterus, or womb.

VULVA is sometimes also used for the cunnus, or whole pudendum muliebre.

VUNENA, a name given by the people of Guinea to a kind of catch-fly, or lychnis, common in that part of the world, and much used by them in a decoction to cure swellings of the legs. Petiver has called it *lychnis Guineensis fructu caryphylloide foliis roris marini, hirsutis, angustioribus*. Phil. Transf. N° 232.

VUOD, in *Mythology*, a god of the Arabians.

VURNWEY, in *Geography*, a river of North Wales, in the county of Montgomery, which runs into the Severn, on the borders of Shropshire.

VUSHOUG, a town of Persia, in the province of Irak; 60 miles N. of Ispahan.

UVSKOI, a town of Russia, in the government of Tobolsk, on the Irtisch; 68 miles N. of Tobolsk.

VUTSHIM, a town of Sclavonia; 18 miles N. of Pesoega.

UVULA, in *Anatomy*, the small conical body, projecting from the middle of the soft palate. See DEGLUTITION.

UVULA, *Disease and Amputation of*. When the uvula is permanently elongated, so as to interrupt swallowing, and occasion uneasiness in the throat, coughing, vomiting, &c. it is proper to remove the redundant part.

Slight relaxations of the uvula may generally be cured by astringent gargles, composed of the infusion of roses, alum, tincture of bark, &c. When, however, the inconvenience cannot be removed by such means, the superfluous portion of the uvula may be cut off with a pair of sharp scissars.

The

The fear of hemorrhage, and the recommendation of the ligature, in these cases, are almost absurd, notwithstanding the contrary statements of a few modern writers.

UVULARIA, in *Botany*, a genus established and named by Linnæus, is recorded, *Philos. Bot.* 168, to owe this appellation to the resemblance of its inflorescence to the *uvula*, "*figura inflorescentiæ uvulæ.*" Now this not being the case with the genus in question, though Linnæus says, in *Hort. Cliff.* 121, "*fructificatio uvulæ instar dependet*," we might have wandered far in search of a meaning, or, like our predecessors, been content with little or no enquiry, had we not stumbled, at the outset, upon *Uvularia* as an old synonym for *Ruscus Hypoglossum*, to which the first explanation is obviously applicable, on account of the diminutive leaf, not unlike the *uvula* of the human throat, lying over the inflorescence. Perhaps, therefore, Linnæus, finding this name unoccupied, was the more induced to adopt it for his new genus, on account of the affinity, and resemblance in general habit, of the latter to *Ruscus*. We cannot justify the measure, but it is, at any rate, preferable to deriving the name, as a diminutive, from UVARIA, (see that article,) according to the explanation of De Theis. This indeed would be even less intelligible, the *Uvaria* and *Uvularia* having no characters in common; it would also be totally inadmissible, no generic names being more contrary to rule, or good sense, than diminutives of others already established. (See VALERIANELLA and FEDIA.)—Linn. Gen. 164. Schreb. 219. Willd. Sp. Pl. v. 2. 93. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 246. Pursh 231. Juss. 48. Lamarck Illustr. t. 247. f. 2.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Liliæ*, Juss.

Gen. Ch. *Cal.* none. *Cor.* Petals six, inferior, oblong-lanceolate, acute, erect, straight, very long. Nectary an oblong groove in the base of each petal internally. *Stam.* Filaments six, short, rather broad; anthers vertical, longer than the filaments, erect, oblong, about half the length of the corolla. *Pist.* Germen superior, roundish; style one, divided half way down into three parts, thread-shaped, longer than the stamens; stigmas simple, reflexed, longitudinally downy. *Peric.* Capsule ovate-oblong, triangular, of three cells and three valves, each with a central partition. *Seeds* several, nearly globular, with a tunicated scar.

Eff. Ch. Corolla of six upright petals, inferior. Nectary a chink in the base of each. Stamens shorter than the corolla. Stigmas reflexed. Capsule triangular, of three valves, with central partitions. Seeds several, globose, with a tunicated scar.

Obs. From this genus is now separated the *U. amplexifolia* of Linnæus. (See STREPTOPUS.) The genuine species are perennial herbaceous plants, with alternate, simple, undivided, entire, simple-ribbed *leaves*. *Flowers* axillary or terminal, solitary or umbellate, drooping, yellow, whitish, or brown. They are all strangers to Europe, inhabiting rather mountainous umbrageous situations, in temperate climates, and flowering early in the year. They are obviously allied to *Fritillaria*, but have not flat *seeds*, nor are the *filaments* equal in length to the *corolla*.

1. U. *perfoliata*. Pale Perfoliate Uvularia. Linn. Sp. Pl. 437. Willd. n 4. Ait. n. 3. Pursh n. 1. Sm. Exot. Bot. v. 1. 95. t. 49. (U. perfoliata minor; Michaux Boreal.-Amer. v. 1. 199.)—Leaves perfoliate, elliptical, obtuse with a small point. Corolla bell-shaped, rough on the inside. Anthers pointed.—Native of North America; in shady woods, among rocks, in rich vegetable mould, from Canada to Carolina, flowering in May and June. *Pursh*. *Root* of several spreading, tapering, fleshy, pale fibres. *Stem* solitary, annual, erect, twelve or fifteen inches high, round, smooth, leafy; often a little branched, or subdivided, in an alternate manner. *Leaves* perfoliate at near half an inch from their base, where they are quite flat, not undulated; they are two inches long, smooth on both sides; paler, and rather glaucous, beneath. *Flowers* terminal, solitary, pendulous, on short stalks. *Petals* three-quarters of an inch, or an inch, long, of a pale greenish buff-colour; their inner surface rough with yellowish protuberances. Nectariferous furrow linear, and very small. *Stamens* full half as long as the *petals*. *Anther* about the length of its *filament*, bursting longitudinally at the inner side of each cell, and tipped with an awl-shaped point.

The synonyms collected under this species belong to various others, which Linnæus, in his early acquaintance with the genus, considered as all the same, nor have they hitherto been reduced entirely to order, though much has been done to that effect in the *Exotic Botany*, as well as by Mr. Pursh. *Polygonatum latifolium perfoliatum Brasilianum*, Bauh. Prodr. 136, described as "two cubits high, with perfoliate *leaves*, two inches broad, and four long, and a large white *flower*, whose narrow *petals*, five in number, are two inches long," cannot be clearly referred to any known species. The specimen is reported to have been obtained by Burser from Toupinambault, in Brasil, and Linnæus, by a mark in his copy of Bauhin's Prodromus, appears to have seen it. He hints, by a note in the Sp. Plant., that Burser's supposed Brasilian plants all seemed to have really come from Canada. However this may be, Linnæus's own herbarium shews that he confounded specimens of different species, as well as their synonyms, under *U. perfoliata*, and therefore we dare not confide in him for the above reference, which possibly appertains to some plant unknown to modern botanists. See n. 3.

2. U. *flava*. Small Yellow Uvularia. Sm. Exot. Bot. v. 1. 97. t. 50. Pursh n. 2. Ait. Epit. 376. (U. perfoliata α; Ker, late Gawler, in Curt. Mag. t. 955. U. caule perfoliato; Gron. Virg. 51, according to Clayton's description. Anonymos pudica; Walt. Carol. 123.)—Leaves perfoliate, elliptic-oblong, bluntish; waved at the bottom. Corolla tapering at the base; rough on the inside. Anthers pointed.—In shady woods, on a sandy soil, from New Jersey to Lower Carolina, flowering in May and June. *Pursh*. We have no doubt of this being a very distinct species from the former. The *leaves* are more oblong, and more revolute; angular or wavy at the base. *Flower* larger, more taper and elongated, with narrower, sharper *petals*, one inch and a quarter long, yellow, with orange-coloured granulations on the inner surface. Point of the *anthers* longer and more conspicuous.

3. U. *grandiflora*. Large Yellow Uvularia. Sm. Exot. Bot. v. 1. 99. t. 51. Ait. n. 4. Pursh n. 3. Curt. Mag. t. 1112. (U. perfoliata; Redout. Liliac. t. 184, with many erroneous synonyms. U. perfoliata major; Michaux Boreal.-Amer. v. 1. 199. U. lanceolata; Ait. n. 2. Willd. n. 3. Polygonatum ramosum, flore luteo majus; Cornut. Canad. 38. t. 39. Barrel. Ic. t. 723. Sigillum indicum flore luteo; Stap. in Theophr. 1067. f. 3.)—Leaves perfoliate, oblong, acute; wavy at the base. Petals smooth on both sides. Anthers almost pointless. Nectary roundish.—On shady hills, in a fertile soil, and amongst rocks, from Canada to Carolina, flowering in June. *Pursh*. Nearly twice the size of the last; the *leaves* more oblong and taper-pointed, as well as more wavy, and in some degree plaited, at the base. *Flowers* of a brighter yellow; their petals full an inch and a half long, more conspicuously ribbed, destitute of internal granulations, and furnished with a green roundish nectariferous depression, more like that of a *Fritillaria*,

laria, at the base. *Anthers* longer, and quite linear, with but a slight membranous rudiment of a point, not always discernible. This flowers in our gardens nearly a month earlier than either of the last. We humbly presume that if any two species of any genus be distinct, this and the *perfoliata*, to say nothing of *flava*, must be so, or botany will prove a most uncertain study. The truth is, that no competent botanist had, till lately, seen them together, in a sufficiently perfect state for discrimination. Bauhin's *Polygonatum*, mentioned under our first species, may possibly be the *grandiflora*, the *petals* being supposed white, from their appearance when dry, and being commonly no more than five in the lowermost flower of our plant. Mr. Pursh has verified the *lanceolata* of Mr. Aiton, by an authentic specimen. Indeed the synonym of Cornuti sufficiently determines that point.

4. U. *sessilifolia*. Sessile-leaved Uvularia. Linn. Sp. Pl. 437. Willd. n. 5. Ait. n. 5. Pursh n. 4. Sm. Exot. Bot. v. 1. 101. t. 52. Curt. Mag. t. 1402.—Stem smooth. Leaves sessile, elliptic-lanceolate; glaucous beneath. Petals smooth on both sides. Nectary oblong. Capsule stalked.—In shady woods, from Canada to Carolina, flowering in May and June. The size of this species, and the pale colour of its *flower*, most accord with *U. perfoliata*, but its essential difference from all the preceding consists in the *leaves* being sessile, not in any manner perfoliate. They are sometimes very finely downy beneath, or rather at the edges. *Petals* rather spatulate, with a greenish oblong *nectary*, and no roughness. *Anthers* very slightly pointed. *Stem* smooth, purplish. All these species thrive in moist shady borders of bog-earth, with a portion of loam, and as the herbage dies down to the *root*, survive our ordinary winters without injury. *U. sessilis*, Thunb. Jap. 135, is probably distinct from our *sessilifolia*, but the author furnishes no discriminating characters.

5. U. *puberula*. Downy Uvularia. Michaux Boreal.-Amer. v. 1. 199. Pursh n. 5.—Stem rather downy. Leaves sessile, ovate; rounded at the base. Petals smooth on both sides.—Found by Michaux, on the loftiest mountains of Carolina. He describes it as related to the last, but distinct in its *petals*, being rather larger, though in like manner smooth on the inside, tapering at the upper part into an acute point. The *leaves* are green on both sides, partly embracing the *stem*. We have a specimen gathered by Mr. Menzies on the west coast of North America, which answers exactly to this description. The *leaves* are truly ovate, pointed, having strong ribs, connected by conspicuous transverse veins, and are nearly twice the size of the last. The *stem* is reddish, besprinkled with loose hairs. *Flower-stalks* hairy, as is likewise the *style*. *Anthers* linear, pointless, like those of the *grandiflora*. This specimen answers in foliage and inflorescence to *U. lanuginosa*, Curt. Mag. t. 1490, our Streptopus, n. 3; but the *flower-stalks* and *style* are there represented smooth.

6. U. *hirta*. Hairy Uvularia. Thunb. Jap. 136. Willd. n. 2.—"Stem shaggy. Leaves hairy, clasping the stem."—Gathered by Thunberg, near Jedo, in Japan. The *stem* is round, a foot high, erect, the thickness of a quill, and clothed with long dense hairs. *Leaves* alternate, spreading, heart-shaped, oblong, pointed, seven-ribbed, two inches long, clothed with very short hairs. *Flowers* not observed. *Thunberg*.

7. U. *cirrhosa*. Tendril-leaved Uvularia. Thunb. Jap. 136. Willd. n. 6.—Leaves sessile, linear, each ending in a tendril.—Found by Thunberg, in Japan. "*Stem* round, jointed, striated, smooth, simple, erect. *Leaves* two from the same bud, smooth, a finger's length. *Flowers* from the same bud as the leaves, stalked, drooping. *Footstalk* reflexed, single-flowered, the length of the nail. *Petals* six, oblong, yellow, nearly an inch long. *Filaments* half that length, white. *Anthers* oblong, two-lobed, within the flower. *Style* one, rather shorter than the corolla, but longer than the stamens. *Stigmas* three, reflexed." *Thunberg*. This description does not leave any doubt respecting the generic character, but it does not express whether the *flowers* are solitary, as in all the American genuine *Uvulariæ*, or aggregate, as in the following oriental doubtful ones. There being two *leaves* from one bud with the *flowers*, is remarkable, but the author has not clearly expressed whether these are all the leaves borne by one *stem*, of which his description excites some suspicion.

Mr Gawler (Ker) has described in Curt. Mag. t. 916, an *U. chinensis*, of which we were favoured, in May 1811, with an authentic specimen from the stove at Kew. This may be defined—flowers in an umbel, sessile on the footstalk of a leaf. It is reported to be a native of China. The *stem* is herbaceous, about eighteen inches high, angular, smooth, leafy, a little zigzag, branched alternately in the upper part. *Leaves* alternate, on short stalks, ovato-lanceolate, pointed, many-ribbed, smooth, two or three inches long; three of their ribs stronger than the rest. *Umbel* of three or four drooping *flowers*, sessile on the footstalk of one of the leaves; its *partial stalks* about half an inch long, with several roughish angles. *Petals* pointed, brown, twice as long as the stalks; smooth within, all elongated and gibbous, almost spurred, at the base. *Filaments* two or three times the length of their *anthers*, both together nearly equal to the *petals*. *Germen* turbinate, triangular. *Style* nearly as long as the *stamens*, with three recurved *stigmas*. Nothing is known of the *fruit*. The close affinity of this plant to one we shall now describe, which is certainly no *Uvularia*, will not allow us to admit either into our list of species. We allude to a specimen gathered by Dr. Buchanan, on the moist banks of rivers at Chitlong, in Upper Nepaul, in April 1802. This bears its flowers in a stalked umbel, from the footstalk of a leaf.—The *stem* and *leaves* closely accord with the Chinese species just described; but the *umbels*, consisting of seven or eight green *flowers*, are each supported by a common deflexed *stalk*, almost as long as the partial ones, and, like them, rough-edged. *Petals* but half the length of the stalks, gibbous, and almost tubular at the base; the three outermost a little the broadest and shortest. *Filaments* thrice the length of the *anthers*, which are linear, cloven at each end. *Stigmas* three, recurved, deeply separated. *Berry*, according to Dr. Buchanan, three-lobed, of three cells, with solitary *seeds*. Such a fruit cannot belong to *Uvularia*. These two species must therefore, in the present state of our knowledge, be referred to Streptopus, (see that article,) to which we would make the following additions.

2. S. *roseus*. (Uvularia rosea; Curt. Mag. t. 1489.)—Flowered in Kew-garden, in May 1812. The *flowers* are bigger than those of *S. amplexifolius*, and are elegantly spotted with red.

3. S. *lanuginosus*. (Uvularia lanuginosa; Curt. Mag. t. 1490.)—Brought from North America by Mr. Lyon, with whom it flowered in May 1812. The *flowers* stand in pairs, their *stalks* slightly combined at the base. *Stamens* but half the length of the narrow green *petals*.

4. S. *chinensis*. Brown Chinese Streptopus. (Uvularia chinensis; Curt. Mag. t. 916. Ait. n. 6.)—Leaves on short stalks. Umbels sessile. See its description above.

5. S. *peduncularis*. Long-stalked Streptopus. (Uvularia Pitsutu; Buch. MSS.)—Leaves on short stalks. Umbels

bels on general ſtalks, nearly as long as the partial ones. Of this alſo we have juſt given a deſcription. We know nothing of the ſhape of the *ſeeds* in this ſpecies, nor whether they are furniſhed with any appendage, or tunic, at their ſcar. If they ſhould prove to want this character, that circumſtance, added to the gibbous, almoſt tubular, nectariferous baſes of their *petals*, and the great comparative length of their *filaments*, with reſpect to the *anthers*, might almoſt lead to their eſtabliſhment as a new genus. Before this could be done, however, we ought to be well acquainted with the *fruit*, *ſeeds*, and their *ſcar*. in *Streptopus lanuginoſus*, whoſe twin *flowers* connect theſe two umbellate ſpecies with the ſolitary *infloreſcence* of the *S. amplexifolius* and *roſeus*.

The concluding paragraph of our article STREPTOPUS ſhould now be eraſed.

UVULARIA, in the *Materia Medica*, the name given by authors to the plant called *hypogloſſum*, or double tongue.

UUZEDERINA, in *Geography*, a town of Bulgaria, on the Danube; 50 miles W. of Nicopolis.

UWCHLAND, a townſhip of Pennſylvania, in Cheſter county, containing 1178 inhabitants.

UXACONA, in *Ancient Geography*, a town of Great Britain, in Antonine's ſecond Itin., marked between Uriconium (Wroxeter) and Pannocrucium (at or near the river Penk, and town of Penkridge). Dr. Gale and Mr. Camden place Uxacona at Okenyale, and Mr. Baxter at Newport; but Mr. Horſley, following the tract of the military way, and obſerving the diſtance, fixes it at the banks of a rivulet near Sheriff-Hales.

UXAHVER, OX-SPRING, a boiling fountain of water, about a mile from a place called Huſavik, in the north of Iceland, not far from Skalholt, more regular, and nearly equal to the Geyſer in the magnificence of its operations. It is ſaid that this name was given to it from the circumſtance of an ox having fallen into it by accident, and having been boiled alive.

We ſhall here add, that the Geyſers are celebrated fountains, about 16 miles N. of Skalholt, ſituated in a country indicating many traces of volcanic eruptions. They lie on the ſide of a hill, which does not exceed 300 feet in height, and which is ſeparated from the mountain towards the W. by a narrow ſtripe of flat boggy ground, connected with that which extends over the whole valley. On the E. ſide of the hill there are ſeveral banks of clay, from ſome of which ſteam ariſes in different places, and in others there are cavities in which the water boils briſkly. Below theſe banks there is a gentle ſlope, compoſed of matter, which, at ſome diſtant period, has been depoſited by ſprings that no longer exiſt. The ſtrata or beds thus formed ſeem to have been broken by the ſhocks of earthquakes, particularly near the Great Geyſer. Within the ſpace of about a mile there are numerous orifices in the old incruſtations, from which boiling water and ſteam iſſue, with different degrees of force; and at the northern extremity is the Great Geyſer, ſufficiently diſtinguiſhable from the others by every circumſtance connected with it. Amidſt the depoſitions of matter is a mount about ſeven feet high, lying on the W. ſide, where a diſruption has taken place. On the top of this mount is a baſon, extending 56 feet in one direction, and 46 in another. The baſon was full of hot water, a little of which was running over. Above the Great Geyſer, and near it, is a large irregular opening, the beauties of which it is hardly poſſible to deſcribe. The water which filled it was as clear as cryſtal, and perfectly ſtill, though nearly at the boiling point. Through it were ſeen white incruſtations, forming a variety of figures and cavities, to a great depth; and below was perceived a vaſt and dark abyſs, over which the cruſt that ſupported the obſervers formed a dome of no great thickneſs; a circumſtance which contributed much to the effect of this awful ſcene. Near this ſpot are ſeveral holes, from which vapour continually riſes; and from one of which a rumbling noiſe proceeded. One of the moſt remarkable of theſe ſprings threw out a great quantity of water; and from its continual noiſe it was called the Roaring Geyſer. The eruptions of this fountain were inceſſant. The water daſhed out with fury every four or five minutes, and covered a great ſpace of ground with the matter it depoſited. The jets were from thirty to forty feet high. They were ſhivered into the fineſt particles of ſpray, and ſurrounded by great clouds of ſteam. The ſituation of this ſpring was eighty yards diſtant from the Geyſer, on the ſide of a hill. It is probable that an earthquake has damaged the mechaniſm of this ſpring, or the production of heat, at the particular ſpot where it is ſituated, has ceaſed to be ſufficient to produce the phenomena which it formerly exhibited. In collecting incruſtations near the baſon, and ſtriking on its brink many blows with a hammer, a ſound was heard like the diſtant diſcharge of a piece of ordnance, and the ground ſhook. The ſound was irregularly and rapidly repeated; and then the water, after having ſeveral times ſuddenly riſen in a large column, accompanied by clouds of ſteam, from the middle of the baſon to the height of ten or twelve feet, the column ſeemed as if it burſt, and ſinking down, it produced a wave which cauſed the water to overflow the baſon in conſiderable quantity. After the firſt propulſion, the water was thrown up again to the height of about 15 feet; and there was a ſucceſſion of jets, to the number of eighteen, none of which appeared to exceed fifty feet in height, and they laſted about five minutes. After the laſt jet, which was the moſt furious, the water ſuddenly left the baſon, and ſunk into a pipe in the centre. The heat of the baſon ſoon made it dry, and the wind blew aſide the vapour almoſt immediately after the ſpouting ceaſed. The pipe, into which the water had ſunk about ten feet, was immediately examined, and it appeared to be riſing ſlowly. The diameter of the pipe, or rather pit, is 10 feet, widening near the top to 16 feet. The perpendicular depth of the baſon is three feet, that of the pipe is ſomewhat more than 60 feet. When the water was ſtill, ſtones were thrown into the pipe, and a violent ebullition followed. The temperature of the water within reach, when the pipe was full, was found to be 209°. At repeated intervals freſh jets occurred, none of which exceeded 30 feet in height. But we have not room to enlarge in the detail of various other circumſtances obſerved by thoſe who examined theſe extraordinary fountains. The depoſitions of the preſent and former ſprings are viſible to a great extent, about half a mile in every direction, and they probably extend themſelves under the ſurface, now covered with graſs and water to a very conſiderable diſtance.

Although hot ſprings occur in every part of the country, the Geyſers are the moſt remarkable, and muſt have exiſted for a long time; but as they are ſituated on the verge of that vaſt diſtrict of uninhabited and deſolate country which forms the interior of Iceland, they have not been particularly noticed by the early Icelandic authors; nor are they now much viſited by the natives. In order to account for the phenomena exhibited by the operations of theſe ſprings, it is ſuppoſed that they are occaſioned by ſudden productions of heat, whatever may be the cauſes of that heat. A column of water is ſuſpended in a pipe by the expanſive force of ſteam confined in cavities under the ſurface. An additional quantity of ſteam can only be produced by more heat being evolved. The heat is ſuddenly evolved, and elaſtic

elastic vapour suddenly produced, we may account for the explosions accompanied by noises. The accumulation of steam will cause agitation in the column of water, and a farther production of vapour. The pressure of the column will be overcome; and the steam escaping, will force the water upwards along with it. For a further account of these springs, and of the causes that produce them, illustrated by appropriate engravings, we refer to Mackenzie's Travels in Iceland, p. 211, &c. See *Boiling* SPRINGS.

UXAMA, (*Osma*,) in *Ancient Geography*, a town in the interior of Hispania Citerior, belonging to the Arevaci, S.E. of Clonia.

UXAMABAREA, a town of Hispania Citerior, belonging to the Autrigones. Ptolemy.

UXBRIDGE, in *Geography*, a market-town in the hundred of Elthorne, and county of Middlesex, England, is situated 18 miles W. by N. from St. Paul's cathedral, London. Though the most considerable town in the county, it is only a hamlet to the parish of Hillingdon. The name of this place was anciently written *Oxebruge*, and in subsequent records *Woxebruge* or *Woxebrugge*: the mode of orthography in present use appears, however, to have been adopted for several centuries. The compound term of which this appellation was formed, appears easy of explanation: the place was noted, in remote ages, for the passage of oxen from the adjacent rich pasture lands of Buckinghamshire, and a bridge was constructed over the river Colne at a very early period. Leland says of this town—"In it is but one long street, but that, for timber, well builded. There is a celebrate market once a week, and a great fayre on the feast-day of St. Michael. There be two wooden bridges at the west ende of the towne, and under the more weste goeth the great arme of Colne river. The lesser arme goeth under the other bridge, and each of them serve there a greate mille." Uxbridge, at present, consists principally of one long and wide street: the greater part of the houses are old; but there are several of modern construction, which are at once commodious and ornamental. The main stream of the Colne, and several of its diverging branches, water the town on the Buckinghamshire side, where the principal channel is crossed by a substantial bridge of brick. Over the Grand Junction Canal, which passes the same division of the town in its progress along the western border of Middlesex, is likewise a bridge of a similar description. The difference, as to the appearance and character of the place, between the 16th century and the present period, thus seems to consist chiefly in the substitution of brick for timber, in the houses and bridges. The most memorable historical event connected with Uxbridge, is the unsuccessful treaty which here took place between commissioners appointed, by the king on one side, and by the parliament on the other, during the civil disturbances of the 17th century. These commissioners, sixteen on the part of the king, and twelve for the parliament, met in January 1645; all of them distinguished noblemen or persons of great eminence on each side: commissioners from the parliament of Scotland likewise attended the meeting. It was soon found that no rational discussion could be expected: the demands of the parliament were exorbitant, and their commissioners were not inclined to accommodation: after twenty days passed in debate, in which the result appeared to be predetermined, the commission was dissolved, and the decision unhappily left to the sword. The mansion in which the commissioners met is still remaining, and is situated at the western extremity of the town. It has been recently converted into an inn, bearing the sign of the Crown, and has undergone considerable alterations. Two principal rooms remain in their original state; one of which, from tradition, and from its capacious dimensions, appears to be that used by the commissioners. To the present day, the building is termed the Treaty House. This mansion, with the ceremonial and procedure of the commission, is particularly described by lord Clarendon in his "History of the Great Rebellion." Uxbridge does not afford any public buildings peculiarly interesting. Its chapel is an irregular edifice, chiefly composed of flint and brick: it is in the pointed style of architecture, but quite destitute of the imposing beauty which that mode of building is capable of producing: its interior comprises a chancel, a nave, and two aisles, divided by pointed arches. It is believed that a chapel existed here so early as the year 1281; but it is not mentioned in the records of Hillingdon till 1469: yet, that Uxbridge did possess a chapel prior to the latter date is evident; for, in 1447, Robert Oliver and other inhabitants founded a guild "in the chapel of St. Margaret at Woxbridge;" and in 1459 a chantry in this chapel was founded and endowed by sir Walter Shiryngton. In 1682, George Townsend, esq. taking into consideration that in such a populous town the place of worship was destitute of a suitable endowment, bequeathed certain tenements in London for the maintenance of a minister to reside in or near Uxbridge: and in 1706, a house was built by the inhabitants for the use of the resident minister, on condition of his instructing six poor boys in reading and writing, or otherwise paying 6*l.* *per annum* to the churchwardens. This house is let by the present minister, and six boys are instructed at his cost in the parochial school. Here are meeting-houses for Quakers, Presbyterians, and Methodists. In 1695, George Pitt, esq. conveyed the manor of Uxbridge, with its tolls and appurtenances, to certain inhabitants of the town, in trust, that the profits should be applied to charitable purposes. This liberal grant is immediately connected with the schools for gratuitous education, of which there are two in the town, both much enlarged in 1809. The school for boys is assisted with fifty guineas annually from the fund; and the girls' school with twenty guineas; and both are further aided by voluntary contributions. Two hundred boys and sixty girls are thus educated; and the girls are clothed and further qualified to become valuable servants. The Lancaster system is adopted in each school; and both establishments are accommodated with convenient school-rooms in the upper part of the market-house, which is an extensive brick edifice, erected in 1789. Beneath it is a spacious area for pitching corn, and for the resort of the farmers and dealers. Henry de Lacy, earl of Lincoln, obtained, in 1294, the grant of a weekly market on Mondays, and an annual fair on the feast of St. Michael. The market is now held on Thursdays, and is one of the most considerable marts for corn in this part of the kingdom. A fair is still held on Michaelmas day for hiring servants, &c., and here are three other fairs for cattle. The internal police of the town is regulated by two bailiffs, two constables, and four tything-men or headboroughs. In the survey of the year 1811, the population of Uxbridge was returned as 2411, occupying 450 houses. No manufactures of importance are cultivated; but here are several corn-mills on a large scale, and meal may be said to form the chief trading pursuit of the town. Great advantages in trade arise from the market, and from the numerous seats in the vicinity. This town gives the title of earl to the Paget family. Henry lord Paget was created earl of Uxbridge in 1744: by the death of his grandson, the title became extinct in 1769; but was revived in 1784, in the person of Henry Bailey, a cousin and heir of the deceased, who had assumed the

the name and acceded to the barony of Paget: the son of this nobleman is now earl of Uxbridge, and has recently been created marquis of Anglesey, in consequence of his military achievements on the continent.

At a short distance from the town, on the eastern side of the road leading towards London, is the seat of Richard Henry Cox, esq. This mansion was erected in 1717 by the last duke of Schomberg, who had resided several years in an ancient house on the estate. It was afterwards the property and residence of the Chetwynd family, and about 1785 was purchased by the late marchioness of Rockingham, who passed the remainder of her life here. It was afterwards purchased by Josiah Du Pre Porcher, esq. who sold it to Mr. Cox, the present proprietor.

On the border of Uxbridge Common, in the immediate vicinity of the town, is the residence of Thomas Harris, esq. joint patentee of Covent Garden theatre. This is a spacious brick dwelling, with extensive gardens, on which the proprietor has been lavish in embellishments. One portion of this domain requires particular notice—a mimic hermitage, decked with sculpture, spars, &c. opens to a spacious room, in which are preserved portraits of the principal theatrical performers, from the date of Garrick to the present period.

About one mile N.E. from Uxbridge, in the parish of Ickenham, is Swakeley or Swateley House, the property and residence of Thomas Clarke, esq. It was erected in 1638, by sir Edmond Wright, who, in 1641, was appointed lord mayor of London by the parliament, after the removal of sir William Acton from that office. The mansion was afterwards successively the property of sir William Harrington, one of the judges of king Charles I., and of sir Robert Vyner, the facetious lord mayor of London, who entertained Charles II. at Guildhall. It was subsequently the seat of Benjamin Lethieullier, esq. of whom it was purchased in 1750, by the father of the present proprietor. The house, which is a square substantial structure, with two slightly projecting wings, is composed of brick, with stone coinges, window-cases, and finishings. The entrance is through a porch in a square central turret, which opens into a hall paved with black and white stone. Here is a carved screen, surmounted by a bust of Charles I. A staircase of oak, with the sides and cieling painted, leads to a suite of apartments, in which capacious and well-proportioned dimensions are pleasingly blended with an air of domestic comfort.

Within two miles of Uxbridge, on the south-west, is Delaford-Park, the seat of Charles Clowes, esq. The ancient mansion of Delaford, which stood in a low and unfavourable spot, was taken down about the year 1790, and the park attached to it was added to the adjacent grounds belonging to Mr. Clowes, whose dwelling occupies a more elevated scite, and was partly built by the late viscount Kilkenny, but has been considerably enlarged by the present owner.

The village of Hillingdon, in which parish Uxbridge is comprised, is one mile distant from the town, to the south-east, and contains many substantial and commodious houses. The parish church, which stands on the side of the high road, is an ancient structure, chiefly composed of flint and stone, having a square tower at the west end, with an embattled parapet, and a bell-case of wooden frame-work: the interior is divided into a nave, chancel, and two aisles, separated by octangular pillars and pointed arches. Monuments and other sepulchral memorials are unusually numerous, both in the church and cemetery, in consequence of the parochial connection of this place with Uxbridge. In the church-yard is the tomb of John Rich, esq. formerly a patentee of Covent Garden theatre, well-known as the inventor of the English harlequin, and for his excellent performance of that character, under the assumed name of Lun. On the north side of the church is an ancient mansion, commonly called the Cedar-house, from the celebrated cedar-tree which grew in the garden. This tree was planted by Samuel Reynardson, esq., who appears to have resided in this house from 1678 till his death in 1721. The first introduction of the cedar into England was in 1683; and it is probable, as Mr. Reynardson was a naturalist, and had a curious garden of exotics, that this was one of the earliest planted. It was accurately measured in 1779, when its dimensions were in perpendicular height fifty-three feet; diameter of the horizontal extent of the branches, from east to west, ninety-six feet; from north to south, eighty-nine; girth of the trunk, close to the ground, fifteen feet six inches, and at the height of fourteen feet and a half, just under the division of the principal branches, fifteen feet eight inches. The girth of the larger branch, at a foot and a half from its division, was twelve feet; it then divided into two secondary branches; one of which was eight feet six inches in girth, the other seven feet ten inches; the other principal branch, at its division, measured ten feet in girth, and soon dividing, formed two secondary branches, each five feet six inches in girth. In September 1789, one of the largest branches was broken off by a high wind, in consequence of which the tree was cut down. Above eighty years' growth were discernible beyond the centre-piece. The tree produced 450 feet of timber, six loads and three-quarters of stack-wood, and one hundred and a quarter of faggots. Mr. Lovett, a carpenter of Denham, purchased the tree for 10*l.*, and retailed it for 22*l.* 17*s.* After the death of Mr. Reynardson, the Cedar-house was the seat of general Rich Russell, who died in 1735. It is now the property of Richard Heming, esq., and in the occupation of Lacey Primatt, esq. At a short distance from the church, to the south, is the rectory-house, a spacious building, erected in 1604. It appears that a mansion on this scite was formerly held by the bishops of Worcester as an inn, or resting-place, in their journeys to London.

On Hillingdon Heath, a considerable tract of land to the south-east of the village, are several respectable villas, chiefly of a modern date. One of these, an old mansion, formerly occupied by the duke of Buccleuh, is now the residence of Thomas Bent, esq. by whom it has been greatly improved, and who has been at a very considerable expence in ameliorating part of the heath. In this vicinity is Hillingdon-Place, a seat erected by the late admiral Drake, and now in the occupation of the Miss Fullers. On the south side of the heath is a spacious dwelling, built by the late Peter de Salis, count of the Roman empire, who resided here several years. This house stands on an estate called Coomes, alias Little London, and sometimes termed Hillingdon Park. The parish of Hillingdon, exclusive of Uxbridge, was, in the year 1811, stated to contain 419 houses, and 2250 inhabitants.—Beauties of England and Wales, vol. x. Middlesex. By J. N. Brewer, 1816. Lysons' Middlesex Parishes, 4to. 1800.

Uxbridge, a town of the state of Massachusetts, in the county of Worcester, containing 1404 inhabitants; 35 miles W. of Boston.

UXELA, or Uxella, in *Ancient Geography*, a town of Britain, belonging to the Damnonii, the ancient inhabitants of Devonshire and Cornwall; supposed by Mr. Camden to have been situated at Lostwithiel; by Mr. Baxter, at Saltash; and by Mr. Horsley, at Exeter. Others have placed it on the river Parret, near Bridgewater. See Damnonii.

UXELLODUNUM, a place which was the last which Cæsar held in Gaul; but its situation has been much disputed. Sanson refers it to the territory of the Cadurci, or Cahors; others have fixed it at Cadenac, upon the confines of Kouergue; and others again at Luzeto, upon the Olt, but below Cahors. But the position of Uxellodunum, and which unites the greatest number of suffrages, is that of Pucach d'Issola. "Podium Uxelli" is the northern part of Querci, towards the frontier of Limosin.

UXELUM, a town of the Selgovæ, placed both by Horsley and Baxter at Caerlaveroch near Dumfries; and this opinion is the more probable, because the two names, Uxelum and Caerlaveroch, seem to be derived from British words, which signify a town near the sea-coast. Carbantorium, placed by Camden at Caerlaveroch, below Dumfries, was probably situated where Dumfries now stands, or near it.

UXENA, a town of Hispania, in Bœtica.

UXENTUM, a town of Italy, in the interior of Messapia, belonging to the Sulentini; situated S.W. of Hyaruntum. Ptol.

UXENTUS, a mountain of India, on this side of the Ganges. Ptol.

UXIA, a town of Asia, in the Perside, at a small distance from the sea. Ptol.

UXII, a people of Asia, in the Elymaide. They inhabited a territory on the other side of the town of Suze, beyond the Pasitigris, and on the confines of proper Perside, according to Quintus Curtius and Arrian. The river Pasitigris had its source in the mountains of the Uxians, according to Diodorus Siculus. These people were divided into two nations: those who inhabited the plain were subject to the Persians, and of these Diod. Sic. speaks (l. xvii. c. 67.) Those who inhabited the mountains before the Perside maintained their liberty, and of them Strabo speaks (l. xv.) This author calls the country of the Uxians by the name of Uxia, and he says that they were great robbers; and Pliny gives them the same character. See UTII.

UXITICO, in *Geography*, a town on the south coast of the island of Rhodes. N. lat. 36° 9′. E. long. 27° 34′.

UXOR, in the *Language of the Chemists*, the mercury of metals. This is the wife they say, and sulphur is the husband. See MARITUS.

UXORIUM, in *Antiquity*, a fine, or forfeit, paid by the Romans for not marrying.

UXUMI, or OOSUMI, in *Geography*, a town of Japan, on the island of Ximo. N. lat. 32°. E. long. 133°.

UYA, a small island near the west coast of Shetland. N. lat. 60° 43′. W. long. 1° 54′.

VYAGRAYAHI, in *Mythology*, a name of the Hindoo goddess Parvati, consort of Siva. The name means *tiger-mounted*; this goddess, like Cybele, being seen riding in a car drawn by lions or tigers, and turret-crowned.

VYAHRITIS, mystical words used by enthusiastic Hindoos in their abstracted modes of worship called *Jap*, which see. Every thing ternary being mysterious with the Hindoos, the Vyahritis are of course *three*; viz. *bhur*, *bhuvah*, *swer*, or earth, sky, heaven. This triverbal phrase is profoundly mystical.

VYASA, in *Biography*, a personage of great celebrity and sanctity in the history of the Hindoos, as arranger or compiler of their sacred books called the Veda. His real name is supposed to have been Dwapayana, or Krishna Dwapayana; and his surname of Vyasa, or *Divider*, to have been given him from his great work. An incarnation of the god Vishnu is sometimes mentioned as the arranger of the Hindoo scriptures in their present form. In the eighteenth Purana, called Sri-Bhagavata, twenty-two incarnations of Vishnu, there called Krishna, the Preserver, are enumerated; the seventeenth is thus noticed: "As Vyasa he divided the Veda for the instruction of mankind." See KRISHNA, PURANA, and SRI-BHAGAVAT. But this probably means that he acted under the influence of immediate inspiration; an idea fully concurred in by the numerous believers in the divine origin of the Vedas.

It is usual with the Hindoos to ascribe to Vyasa the Puranas and Mahabarat, as well as the Vedas. (See MAHABARAT and PURANA.) But it is not credible that the talent and industry of any human being, and we are not, in this instance, required to believe in any superhuman aid, could effect so much. Nor, from internal evidence, is it possible that they could have originated in the same age.

To Vyasa is likewise ascribed a celebrated and popular system of philosophy, grounded wholly on the doctrines of the Veda, and thence named *Vedanta*; which see. It is written in a very dogmatical, sententious stile, and is very obscure. A commentary by the learned Sankaracharya (see his article) explains, however, in a very admirable manner, almost every sentence and difficult word.

The doctrines of Vyasa were expounded and supported also by a disciple named Jaimini, who appears to have been cotemporary with his master. His school is called *Mimansa*, which see, and JAIMINI.

It is not necessary to inquire into the time in which an author flourished, who connects himself with works stated to be thousands of years old; and on which considerable differences of opinion exist among the best informed. Nor is it very profitable to inquire after the family of a person believed to have been an incarnation of a deity. It may, however, be noticed, that some books mention a son of Vyasa named Sucha; Parasara his father, grandson of Vasishta, is mentioned in the Veda as an author of some portions of the work; but this is explained to mean that he was one of the Rishis, or saints, to or through whom such portions were revealed by Brahma. See RISHI and VASISHTA.

The encomiums on Vyasa scattered through the poetical works on all subjects, since his embrace all throughout the East, are endless. See an instance of this in our article TRIVENI.

UZAN, in *Ancient Geography*, a town of Africa Propria, of the number of those which Ptolemy places between the river Bagradas and the river Tabraca.

UZBEKS, or USBEKS, in *Geography*, a tribe of Tartars, who inhabit Kharasm, (which see,) and Great Bucharia, and who, according to Abulgasi, consist of four main stocks, of which the Naimanes and Igures are known from the history of Jenghis, Tchingis or Zingis khan. Those two hordes formerly dwelt, the former on the western side of the native territories of Tchingis, and the latter in Turfan. Of their settlement in *Great Bucharia*, and other circumstances relating to them, we have already given an account under that article. They are said to have derived their name from Uzbek, khan of Kipjak.

UZECIA, in *Ancient Geography*, a town of Africa Propria, S. of Adrumetum, and at a small distance from Thysdrus.

UZEDA, or UCEDA, in *Geography*, a town of Spain, in New Castile, on the Xarama; 30 miles N. of Madrid.

UZEL, a town of France, in the department of the North Coasts; 6 miles N.N.W. of Loudeac.

UZERCHE, a town of France, and principal place of a district, in the department of the Correze; 13 miles N.W. of Tulle. N. lat. 45° 25′. E. long. 1° 39′.

UZE'S, a town of France, and principal place of a district, in the department of the Gard. Before the Revolution, the

the see of a bishop; near it is a medicinal spring, and a little below the bishop's palace is a spring which supplies the aqueduct of Nismes; 12 miles N. of Nismes. N. lat. 44° 1′. E. long. 4° 30′.

UZES, called also KUMANIANS or POLOOTZES, in *Ancient Geography*, are mentioned both by Herodotus and Strabo. At the period when history records their activity as a nation, (A.D. 883,) that is, when, in conjunction with the Khazares, they drove the Petschenegrans from their homesteads, they had already extended themselves from Alhava toward the mountains of Kitzig-tag, as far as the nether Volga. They now took the countries of the expelled Petschenegrans into possession, and one of their stems seized the occupancy of the original abodes of the Khazares (see KHAZARES), on the western side of the Volga and the Caspian as far as Derbent. In the eleventh century, they spread into the eastern parts of Europe. They wrested from the Petschenegrans almost all which they had hitherto possessed in that quarter of the globe, particularly the Krim, the countries between the Don and the Dnieper, with Moldavia and Walachia. After they had continued their ravages for a long time in Bulgaria, Thrace, Transylvania, and Hungary, and were in a great measure brought to ruin, they at last settled in Hungary. Towards the end of the eleventh century, they captured the north-eastern part of the Kuban from the Russians, who were at that time torn to pieces by intestine dissentions. In the former half of the thirteenth century, they lost by the Tshingises, Moldavia, Valachia, and the Krim. In the year 1392, the Kumanians were numbered among the nations which belong to the state of Hungary; but from that time they cease to be an historical nation. The Petschenegrans above mentioned, named by themselves Kengar or Kengli, were a powerful wandering nation on the rivers Volga and Ural. They became first known in Europe by their marches into the Khazarian empire in 839, and by their wars in 867 with the Slavonians, a little time before made tributary to the Khazares. Driven from their seats by the Uzes and Khazares, they made themselves masters of the country between the Don and the Dniester, and expelled thence the Hungarians subject to the Khazares. In the eleventh century, they migrated towards Moravia, Bulgaria, and Thrace, and established themselves, after committing frequent ravages, in the countries of the East Romans in Dardania and the lesser Scythia. At the close of the twelfth century, they possessed a part of Transylvania, and about that time they gradually vanished out of history. Tooke's Russia, vol. i.

UZETTE, in *Geography*, a town of France, in the department of the Gironde; 6 miles W. of Bazas.

UZIFIR, UZUFAR, or UZIFUR, in *Chemistry*, a name which some authors give to cinnabar.

UZITA, in *Ancient Geography*, a town of Africa Propria, S. of Adrumetum. Ptolemy.

UZKUND, in *Geography*. See URKEND.

UZMEY, a district of Daghestan, situated between two small rivers, extending about 60 versts along the Caspian, and about the same distance in breadth. See DAGESTAN.

UZNEK, a town of Persia, in the province of Adirbeitzan; 10 miles S. of Selmas.

W.

W, A letter peculiar to the northern languages and people; as the English, Dutch, Polish, and others of Teutonic and Sclavonic original.

The form and the sound of *w* are excluded from all the languages derived from the Latin; though it is not improbable, says Dr. Johnson, that by our *w* is expressed the sound of the Roman *v*, and Eolic *f*. However, the *w* is sometimes admitted into the French, Italian, &c. in proper names, and other terms borrowed from the languages in which it is originally used.

In English, the *w* is usually a consonant; and as such, may go before all the vowels, except *u*; as in *want*, *weapon*, *winter*, *world*, &c.

If it be a consonant, its sound is uniform. Some grammarians have doubted whether *w* ever be a consonant; and not rather, as it is called, a double *u* or *ou*, as *water* may be resolved into *ouater:* but letters of the same sound are always reckoned consonants in other alphabets; and it may be observed, says Dr. Johnson, that *w* follows a vowel without any hiatus or difficulty of utterance, as *frosty winter*.

It is sometimes also a vowel; and, as such, follows any of the vowels *a*, *e*, *o*; and unites with them into a kind of double vowel, or diphthong; as in *law*, *ewe*, *sow*, &c. The English *w* is sounded as in Latin *u*, in *quantum*, *suadeo*, *lingua*. Its sound is commonly like the gross, or full *u*, rapidly pronounced. In French, the sound of the *w* does not differ from that of the single *u*, or rather *ou*. See U.

WA, or WAHE, in *Geography*, a town of Sweden, in the province of Schonen; 4 miles N. of Christianstadt.

WAACKHAUSEN, a town of the duchy of Bremen, on a moor, near the river Hamme; the houses of which are built of stone, sand, and turf. On the Hamme's overflowing its banks, whole districts on this moor, with the oaks growing thereon, (though, to speak more properly, their roots only run along the surface,) the firs, elders, barns, and ovens, are raised by the water to the height of ten or twelve feet.

feet. The trees, however, subside again with the soil, but on the water's ebbing suddenly, frequently fall down; 12 miles N. of Bremen.

WAAG, or VAG, a river of Hungary, which rises in the N. part, and runs into the Danube, 6 miles below Comorn.

WAAL. See WAHAL.

WAALIA, in *Ornithology*, a pigeon, so called by Bruce, which frequents the low parts of Abyssinia, perching upon the highest trees, and sitting quietly in the shade during the heat of the day. These birds fly to a great height, in large flocks, and seem to select a species of the beech-tree for their customary abode, on the mast or fruit of which they chiefly depend for their food. They are rarely seen in the high country, which is supposed to be too cold for them. They are very fat, and the best, without exception, of all pigeons. The Abyssinians, however, do not eat this bird; and dread being defiled by touching it, when it is dead. The waalia is less than the common blue pigeon, but larger than the turtle-dove. Its whole back, and some of the short feathers of its wings, are of a beautiful unvarnished green, more light and lively than an olive: its head and neck are of a duller green, with less lustre; its beak is of a bluish-white, with large nostrils; the eye black, with an iris of dark orange; the pinion, or top of its wing, is a beautiful pompadour; the large feathers of the wing are black; the outer edge of the wing narrowly marked with white; the tail a pale dirty blue; below the tail it is spotted with brown and white; its thighs are white, with small spots of brown; its belly a lively yellow; its legs and feet are a yellowish-brown; its feet stronger and larger than those of birds of this kind. Bruce's Travels, Appendix.

WAALWYK, in *Geography*, a town of Brabant; 10 miles W. of Bois le Duc.

WAAREN. See WAHREN.

WABASH, a beautiful river of America, with high and fertile banks, which waters the Indiana territory, and discharges itself into the Ohio, about N. lat. 37° 33'. W. long. 80° 30', by a mouth 270 yards, 1020 miles below Fort Pitt. In the spring, summer, and autumn, it is passable with batteaux, drawing three feet water, 412 miles to Ouiatanou, a small French settlement on the W. side of the river, and for large canoes 197 miles farther, to the Miami carrying place or portage, 9 miles from Miami village. The communication between Detroit and the Illinois and Ohio countries is up Miami river to Miami village, thence by land 9 miles, when the rivers are high, and from 18 to 20 when they are low, through a level country to the Wabash, and by the various branches of the Wabash to the respective places of destination. A silver mine has been lately discovered about 28 miles above Ouiatanou, on the N. side of the Wabash; salt-springs, lime, sand-stone, blue, yellow, and white clay, are found plentifully on this river.

WABASH, *Little*, a river of America, which runs into the Wabash, N. lat. 37° 40'. W. long. 88° 35'.

WABASH, a township of Indiana, in Knox county.

WABEN, a town of France, in the department of the straits of Calais; 7 miles S.W. of Montreuil.

WABUSKAGAMA, a river of Canada, which runs into the Saguenay, N. lat. 48° 20'. W. long. 70° 18'.

WACHBRUN, a town of the county of Henneberg; 9 miles S.E. of Meinungen.

WACHEIN, a river of Carniola, which rises in the lake of Wacheiner, and runs into the river Save, near Retmansdorf.

WACHEINER, a lake of Carniola; 10 miles W. of Feldes.

WACHENBUCHEN, a town of Germany, in the county of Hanau Munzenberg; 1 mile N.W. of Hanau.

WACHENDORFIA, in *Botany*, was so named by Burmann, in honour of his countryman Everard James van Wachendorff, professor of physic, as well as of botany, at Utrecht, who died in 1758, aged fifty-six. He published, in 1743, an oration on the infinite wisdom of God, as displayed in the Vegetable Creation; and in 1747, *Horti Ultrajectini Index*, an 8vo. of 394 pages.—Linn. Gen. 27. Schreb. 38. Willd. Sp. Pl. v. 1. 248. Mart. Mill. Dict. v. 4. Vahl Enum. v. 2. 163. Burm. Monogr. Amst. 1757. Ait. Hort. Kew. v. 1. 106. Ker in Sims and Kon. Ann. of Bot. v. 1. 234. Juss. 59. Lamarck Illustr. t. 34. Gærtn. t. 15.—Class and order, *Triandria Monogynia*. Nat. Ord. *Ensatæ*, Linn. *Irides*, Juss.

Gen. Ch. *Cal.* none. *Cor.* inferior, permanent, withering, irregular, of six obovate-oblong petals; three upper ones most erect, of which the two lateral ones have each a spur at their base; three lowermost widely spreading. Nectary in the spur of each lateral petal, accompanied by a bristle. *Stam.* Filaments three, thread-shaped, divaricated, declining, curved upward, shorter than the corolla; anthers oblong, incumbent. *Pist.* Germen superior, roundish, with three furrows; style thread-shaped, declining; stigma simple, tubular. *Peric.* Capsule three-lobed, triangular, obtuse, of three compressed cells, and three valves, enveloped in the faded corolla; partitions from the centre of each valve. *Seeds* solitary, rough or hairy, compressed.

Eff. Ch. Corolla inferior, irregular, of six petals; two of them spurred at the base. Capsule of three cells. Seeds solitary, rough.

1. W. *thyrsiflora*. Tall-flowering Wachendorfia. Linn. Sp. Pl. 59. Willd. n. 1. Vahl n. 1. Ait. n. 1. Thunb. Prodr. 12. Burm. Monogr. 2. t. 1. f. 2. Curt. Mag. t. 1060. Redout. Liliac. t. 93.—Leaves perennial, smooth. Panicle oblong, close.—Native of the Cape of Good Hope; thriving in our green-houses with little care, and indeed almost hardy, flowering in May and June. The *root* is perennial, fleshy, saffron-coloured or red, with long simple fibres. *Stem* solitary, simple, erect, leafy, round, or a little compressed, downy, slightly zigzag, about a yard high. *Leaves* numerous, two-ranked, plaited, many-ribbed, tapering at each end, sheathing, permanent. *Panicle* racemose, erect, a span or more in length, compound, downy, composed of numerous large and handsome, but inodorous and short-lived *flowers*, of a fine golden yellow; externally downy, with an orange or tawny hue. The lobes of the *capsule* are much compressed, and sharp-edged. *Seeds* clothed with shaggy chaffy pubescence.

2. W. *paniculata*. Spreading Panicled Wachendorfia. Linn. Sp. Pl. 59. Willd. n. 2. Vahl n. 2. Ait. n. 2. Thunb. Prodr. 12. Burm. Monogr. 4. t. 1. f. 1. Sm. Ic. Pict. t. 5. Curt. Mag. t. 616. (Asphodelus latifolius, floribus patulis flavescentibus, rubicundis intùs maculis notatis; Breyn. Prodr. 3. 22. t. 9. f. 1.)—Leaves annual, smooth. Panicle spreading.—Native of the Cape of Good Hope, in sandy ground. It seems from Plukenet's Mant. 70, where it is called Red-bulb, to have been cultivated by Dr. Uvedale. (See UVEDALIA.) This species however is more tender than the preceding, and rarely flowers in the English collections. The knobs of the *root* are browner, oblong, and nearly vertical. *Stem* but a foot high. *Leaves* fewer, entirely deciduous. *Flowers* larger and handsomer of a deeper orange at the outside; their three upper petals marked

marked with a tranfverfe green or brownifh line, and all nearly equally fpreading, though the central one is rather fmaller than the other two.

3. W. *hirfuta*. Narrow-leaved Hairy Wachendorfia. Thunb. Prodr. 12. Willd. n. 3. Vahl n. 3. Ait. n. 3. (W. villofa; Andr. Repof. t. 398.)—Leaves linear-fwordfhaped, hairy. Panicle rather oblong.—Gathered at the Cape by Thunberg, from whom we have a fpecimen. It flowers in our green-houfes in June, but is not common. Mr. Andrews received his fpecimen from Mr. Vere's garden at Kenfington-gore, where the plant flourifhed abundantly under the care of Mr. W. Anderfon, now curator of the Chelfea garden. This fpecies is well diftinguifhed by the narrownefs, and remarkable long fhaggy white hairs, of its *leaves*. The *ftem* and *panicle* alfo are rather more hairy than in the preceding, and the form of the latter is more elongated, lefs corymbofe. *Flowers* large and handfome, bright yellow; externally tawny; their central uppermoft *petal* concealed in front by the two next, which meet before it: they are all broadifh-obovate, fhaggy at the back.

4. W. *brevifolia*. Short-leaved Hairy Wachendorfia. Ait. n. 4. Ker in Curt. Mag. t. 1166. (W. hirfuta; Ker in Curt. Mag. t. 614? Sifyrinchium ramofum æthiopicum, foliis plicatis nervofis et incanis, radice tuberofâ phoeniceâ; Breyn. Cent. t. 37. Rudb. Elyf. v. 2. 13. f. 10.)—Leaves elliptic-fwordfhaped, hairy. Panicle fpreading.—Native of the Cape, from whence, according to Mr. Aiton, it was introduced into the Englifh green-houfes, in 1795. It flowers in March or April. We have feen no fpecimen, and therefore can only prefume, not affert, that the dingy-flowered plant, figured in t. 1166 of the Botanical Magazine, and the brighter yellow one in t. 614 of the fame work, are varieties of each other. The fhortnefs of the *leaves*, compared with their great breadth, diftinguifhes the prefent fpecies. The two lateral upper *petals* nearly conceal the central one, feen in front, according to Mr. Ker's juft remark, by which the *flowers* obvioufly differ from thofe of *W. paniculata*.

5. W. *tenella*. Linear Smooth-leaved Wachendorfia. Thunb. Prodr. 12. Willd. n. 4. Vahl n. 4.—"Leaves linear, three-ribbed, fmooth. Panicle fpreading, fomewhat compound."—Gathered at the Cape by Thunberg, whofe fpecific character is all we know of this fpecies.

6. W. *graminea*. Grafs-leaved Wachendorfia. Thunb. Prodr. 12. Willd. n. 5. Vahl n. 5. (W. graminifolia; Linn. Suppl. 101.)—Leaves fword-fhaped, channelled, fmooth. Panicle fpreading, compound.—From the fame country. Thunberg confiders this as the rareft Cape plant of its tribe. He has favoured us with a fpecimen of the *panicle* only, not having a duplicate *leaf*. The *inflorefcence* is hairy, as in all the fpecies we have feen; the branches of the *panicle* racemofe, fomewhat zigzag. *Flowers* yellow; externally tawny. *Germen* very hairy, but this feems to be more or lefs the cafe with the whole genus, the fpecies of which differ lefs in their parts of fructification than ufual.

Wachendorfia, in *Gardening*, furnifhes plants of the exotic flowering perennial kind, for the green-houfe, in which the fpecies cultivated are, the fimple-ftalked wachendorfia (W. thyrfiflora); the panicled wachendorfia (W. paniculata); and the hairy wachendorfia (W. hirfuta).

The firft is a red thick tuberous-rooted plant of the flowering kind.

The fecond fort has a creeping tuberculated root, and is fingle-flowered.

The laft chiefly differs from the above in the hairinefs of its leaves, and its long reddifh-brown ftem.

Method of Culture.—Thefe plants may be increafed by offsets, taken from the heads of the roots, in the beginning of autumn, planting them in pots filled with foft loamy earth, mixed with a little fea-fand; and when the feafon proves dry, placing them fo as to have only the morning fun, until the offsets have taken new roots, when they muft be placed in a fheltered fituation, fo as to have the full fun. On the approach of frofts, they fhould be placed in frames, and managed as plants of the tender kind. They are alfo fometimes capable of being propagated by root-fuckers and feeds.

The fecond fort is very impatient of cold, and feldom flowers in this climate.

They produce variety among other potted plants of the green-houfe kind, in collections of that fort.

WACHENHEIM, in *Geography*, a town of France, in the department of Mont Tonnerre; 15 miles W. of Manheim. N. lat. 49° 25′. E. long. 8° 12′.

WACHENROTH, a town of Bavaria; 11 miles S.S.W. of Bamberg.

WACHINELLORE, a town of Hindooftan, in Madura; 20 miles W. of Coilpetta.

WACHOVIA, or *Dobbs Parifh*, a tract of land fo called in North Carolina, confifting of 100,000 acres, purchafed of lord Granville, in 1751, by the Moravians, who named it Wachovia after an eftate belonging to count Zinzendorf, in Germany. In 1755, it was made a feparate parifh, and named Dobbs by the legiflature. Salem is the principal town.

WACHOWICZE, a town of Poland, in Volhynia; 40 miles S.E. of Lucko.

WACHQUATNACH, a Moravian fettlement in Connecticut; 20 miles N. of Stratford.

WACHTENDONK, a town of France, in the department of the Roer, fituated in a marfhy country, on the river Niers, whofe waters fill the ditches; 22 miles N.W. of Dufseldorp.

WACHTERSBACH, or Wæctersbach, a town of Germany, which gives name to a branch of the counts of Ifenburg, with a château, in which the counts of Ifenburg Wachterfbach refide; 15 miles E.N.E. of Hanau. N. lat. 51° 25′. E. long. 6° 14′.

WACHUSET Mountain, a mountain of Maffachufetts, 2990 feet above the level of the fea.

WACKE, or Wacken, in *Mineralogy* and *Geology*, a name given to a rock nearly allied to bafalt, and which may properly be regarded as a more foft and earthy variety of the latter rock: it paffes both into bafalt and green-ftone. See Trap.

Its colour generally inclines to greenifh-grey, brown, or black; it is opaque and dull, yields eafily to the knife, and has rather a greafy feel. It occurs with bafalt and greenftone in beds, or mountain maffes, and graduates into the above-named rocks. Wacke is fometimes compact, and fometimes veficular or amygdaloidal. At Calton-hill, near Edinburgh, it is porphyritic, containing diftinct cryftals of augite and felfpar.

The wacke which is faid to occur in mineral veins, we fufpected to be indurated green earth. The fpecific gravity of wacke varies from 2.617 to 2.887.

Wacke is claffed with fimple minerals by Werner, but is confidered by Cordier as a compound rock of volcanic origin, and compofed of minute cryftals and particles of augite, felfpar, and the other minerals which are found in the different varieties of lava. (See *Volcanic Products* at the end of the article Volcano.) In compound rocks, no two chemical

mical analyſes can be expected to agree, as they muſt vary with the proportions of the prevailing ingredient. A ſpecimen of amygdaloidal wacke analyſed by Withering gave

Silex	- -	63
Alumine	- -	13
Lime	- -	7
Iron	- -	17

Wacke, is fuſible, melting into a vitreous ſlag, the colour of which will vary according to the prevailing ingredient which compoſe this rock. This mineral muſt not be confounded with another rock called grey wacke or grau waccé.

Wacke, *Grey*, or *Grey Wacke*, or *Waccé*, a name given by later geologiſts to a very extenſive ſeries of rocks, the members of which differ greatly from each other in compoſition, ſtructure, and appearance: indeed the name has been applied ſo indefinitely, that it has occaſioned much confuſion and obſcurity in geological deſcriptions, and we conſider the introduction of the term as having tended greatly to retard the progreſs of practical geology. A great variety of very different rocks, the nature of which was not preciſely known, have been claſſed with grey wacke, which ſerved as a name to conceal ignorance under the veil of ſcientific arrangement. Some geologiſts reſtrict the term to thoſe rocks which have a baſis of clay-ſlate; others extend it to all the coarſe grit ſtones which contain rounded and angular fragments united by a cement of any kind; and the French, under the name of pſammite (which they have recently introduced), compriſe along with grey wacke all the coarſe ſand-ſtones of the coal formation. In all extenſive formations of clay-ſlate, the upper beds will frequently contain particles of quartz, flinty ſlate, and other minerals, which ſometimes give them a coarſe and ſometimes a granular appearance; and even in the midſt of beds of pure ſlate, beds of this coarſe ſlate frequently occur, which, when they have a ſchiſtoſe ſtructure, are the grey wacke ſlates of the German geologiſts. Mr. Jameſon defines grey wacke to be a kind of ſand-ſtone very different from any of thoſe that occur in the fletz rocks. It is compoſed of grains of ſand, which are of various ſizes, and ſometimes even approach in magnitude to rolled maſſes. Theſe are connected together by a baſis of clay-ſlate, and hence this rock derives its grey colour and ſolidity. Theſe fragments are quartz, a kind of indurated clay-ſlate, or flinty ſlate.

When the ſandy particles of grey wacke become ſo ſmall as ſcarcely to be perceptible by the eye, it acquires a ſlaty ſtructure, and then forms grey wacke-ſlate, which, he adds, bears a ſtriking ſimilarity to clay-ſlate. "This ſlate has ſeldom a greeniſh or yellowiſh colour, as is the caſe with primitive ſlate, but is uſually blueiſh, aſh and ſmoke grey. It does not ſhew the ſilvery continuous luſtre of primitive clay-ſlate, but is rather glimmering, which originates from ſcales of mica. Quartz ſcarcely occurs in it in layers, but uſually traverſes it in the form of veins. It does not contain cryſtals of f.lſpar, ſchorl, tourmaline, garnet, or hornblende, nor beds of garnet, talc, chlorite-ſlate, or magnetic iron-ſtone. Grey wacke-ſlate contains petrifactions, particularly three varieties that border on grey wacke.

"Grey wacke and grey wacke-ſlate alternate, and are diſtinctly ſtratified; but the ſtratification of the former is more diſtinct than that of the latter. They ſometimes alternate with beds of tranſition lime-ſtone, trap, flinty ſlate and coal-blende. This rock is uncommonly productive of metals, not only in beds but in veins, which latter are frequently of great magnitude. Almoſt all the mines of the Hartz are ſituated in grey wacke. The whole of the lead veins of Lead Hills and Wanlockhead, in Scotland, are ſituated in grey wacke."

It was for a long time contended, that the killas or ſlate of Cornwall was grey wacke: it is now conſidered as a true clay-ſlate, reſting immediately on the granite of that diſtrict. Grey wacke was, by the Wernerian geologiſts, regarded as partly of chemical and partly of mechanical formation; the fragments which it contained were ſuppoſed to be the debris of older rocks; but on this hypotheſis it muſt appear extraordinary that theſe fragments ſhould be ſo limited in their kind, and that granite, ſyenite, gneiſs, and the other primitive rocks, ſhould rarely, if ever, occur in it.

The hypotheſis of the mechanical formation of grey wacke is now abandoned by its former ſupporters; and it is even contended, that the rounded maſſes in many conglomerated rocks and in ſand-ſtones have been formed chemically, and that plum-pudding ſtones are in many inſtances chemical formations, as theſe ſtones ſometimes graduate into the adjoining rocks, and the nodules themſelves not unfrequently alſo graduate into the rock in which they are imbedded.

The occurrence of grey wacke, imbedded in what has been called primitive ſlate, offers a further proof that the origin of this rock, in ſuch inſtances, is not derived from the debris of pre-exiſting rocks, but is more analogous to the formation of porphyries, though the proceſs by which it has been ſolidified did not allow the imbedded particles or nodules to take a regular cryſtalline form. From what has been ſtated, it will appear, that under the name of grey wacke may be claſſed a great variety of rocks, ſome approaching to the nature of porphyry, others to plum-pudding ſtone; others again, where the fragments are imbedded in a paſte, reſemble coarſe grit-ſtones, whilſt many rocks of clay-ſlate, which are not perfectly homogeneous, may be alſo claſſed with grey wacke, though they nearly reſemble primitive ſlate. Whilſt ſuch latitude is allowed to the application of the term, it is obvious that no geological deſcription can convey accurate information where it is introduced, unleſs it be accompanied with a definite account of the compoſition of the rock to which this name is given; and geologiſts would do well to reſtrict its uſe, or to baniſh it altogether from the nomenclature of rocks.

WACKENITZ, in *Geography*, a river which runs from Ratzeburg lake into the Trave at Lubeck.

WACKMOYJUST, a town of Birmah; 12 miles S. of Raynangong.

WACSAW, a town of America, on the line which divides North from South Carolina, where, in the year 1781, 700 Britiſh troops, under the command of lieutenant-colonel Tarleton, came up with a party of Virginian troops, under colonel Burford, amounting to 300 men; the latter being ſummoned to ſurrender refuſed, and a moſt bloody engagement enſued, when few of the Americans eſcaped; 53 priſoners only were taken, except the wounded.

WADAN, or Zala, a town of Fezzan, in the road from Tripoli to Mourzouk; 160 miles N. of Mourzouk. N. lat. 29° 59′. E. long. 15° 12′.

WADD, or Wadding, in *Gunnery*, a ſtopple of paper, hay, ſtraw, old rope-yarns, or tow, rolled firmly into the form of a ball, and forced into a gun upon the powder, to keep it cloſe in the chamber; or put up cloſe to the ſhot, to keep it from rolling out, as well as to prevent the powder, when fired, from dilating round the ſides of the ball, by its windage, as it paſſes through the chaſe, which would conſiderably diminiſh the effort of the powder. From ſome experiments recited in the Military Dictionary, it is inferred, that the judicious ramming of a little wadding over the powder adds about one-fourth part of the whole effect.

Wadd, or *Wad*, in *Mineralogy*, a name given to a ſpecies of

of manganese ore, of which there are four kinds: fibrous wad, ochrey wad, pulverulent ochrey wad, and dendritic wad. See MANGANESE.

The wad of Derbyshire is composed of nearly equal proportions of the oxyds of manganese and iron.

The plumbago of Borrowdale, in Cumberland, is provincially called wad. See PLUMBAGO.

WAD is also sometimes applied to the light tufts of hay which are shaken together; and, in which case, the hay is then said to be wadded. It is likewise occasionally used in some places, to signify the plant woad or would, which is used in dyeing. See WOAD.

WADD, *Pea and Bean*, in *Agriculture*, the small handfuls or portions of these crops which are set up together in a slanting manner, after being cut or pulled, for the purpose of drying, and which are sometimes afterwards tied.

WADD-*Hook*. See WORM.

WADD-*Mill* is a hollow form of wood, to make the wadds of a proper size.

WADDEL, in *Geography*, a town of North Carolina; 30 miles W. of Exeter.

WADDEN, a channel of the German sea, between the island of Ameland and the coast of Friesland.

WADDLE, in *Agriculture*, a name applied in some places to the flatted hurdle of the split-wood kind. It is a very preferable sort of hurdle for many different purposes on farms. See HURDLE.

WADDO, in *Geography*, a town of Sweden, in the province of Upland, on a narrow creek, which communicates with Aland's Haff; 15 miles N. of Nortelge. N. lat. 60°. E. long. 18° 40′.

WADE's POINT, a cape on the coast of North Carolina. N. lat. 36° 7′. W. long. 76° 20′.

WADEBRIDGE, an inconsiderable market-town in the hundred of Trigg, and county of Cornwall, England, is situated partly in the parish of St. Breock, and partly in that of Egloshaile, at the distance of 25 miles W.S.W. from Launceston, and 239 in the same bearing from London. A weekly market on Fridays, and two annual fairs, were granted by king Edward II., in the year 1312, to Walter Stapleton, bishop of Exeter, then lord of the manor. The market is still held, though on a very small scale, for butchers' meat and other commodities; and here are now three fairs. The only object of notice in the town is the bridge over the river Alan, about 320 feet in length, and consisting of 17 arches, which connects the two parishes wherein the town stands. It was built in the reign of Edward IV. by public contributions, and begun by John Lovibond, then vicar of Egloshaile. Hals says, that an indulgence was granted to the contributors in the year 1485; but no record of this appears in the registers of the see of Exeter. The same author adds, that Lovibond gave lands, then worth 20*l. per annum*, for the support of the bridge: these lands are not now let for quite so much. This bridge was made a county-bridge in the reign of James I. Padstow-Haven is navigable to Wadebridge, whither vessels of about 40 or 50 tons carry coals, salt, lime, &c.—Lysons's Magna Britannia, vol. iii. Cornwall, 4to. 1814.

WADEIJ, a town of Arabia, in the province of Yemen; 80 miles S.S.W. of Saade.

WADELS, a river which rises in Radnorshire, and runs into the Lug, in Shropshire, about 3 miles E. of Presteign.

WADENSCHWEIL, a town of Switzerland, in the canton of Zurich; 9 miles S. of Zurich.

WADERO, an island near the west coast of Sweden, in the North sea. N. lat. 56° 24′. E. long. 12° 30′.

WADESBOROUGH, a town of North Carolina; 76 miles S.W. of Fayetteville.

WADEY, a country of Africa, situated to the west of Darfur. It formerly consisted of several states, but being conquered by the Arabs, they were all united into one. The Arabic is the principal language, though many others are said to be spoken.

WADHAM ISLANDS, a cluster of small islands, near the north-east of Newfoundland. N. lat. 49° 57′. W. long. 53° 37′.

WADI ABASSI, a river of Arabia, which runs into the Red sea, 10 miles S.S.E. of Hodeida.

WADI *el Arkik*, a small river of Arabia, which waters the city of Medina.

WADI *Elmahad*, a river of Arabia, which in rainy seasons runs into the Red sea, 25 miles S.S.E. of Hodeida; at other times loses itself in the sands.

WADI *Faran*, a river of Arabia, which runs into the Red sea, 25 miles N.W. of Tor.

WADI *Fatima*, a small river of Arabia, which runs north-west of Mecca.

WADI *Gamus*, or *Valley of Buffaloes*, a valley of Egypt, on the east side of the Nile; 5 miles S. of Enseneh.

WADI *el Kbir*, a river of Arabia, which in rainy seasons runs into the sea near Mocha.

WADI *Meidam*, a river of Arabia, which runs into the sea, 8 miles W. of Aden.

WADI *Schab*, a river of Arabia, which loses itself in the sands, about 18 miles N. of Hodeida.

WADI *Schan*, a river of Arabia, which in rainy seasons runs into the Red sea, 6 miles N.N.W. of Hodeida; in dry seasons it loses itself in the sands.

WADI *Suradaj*, a river of Arabia, which in rainy seasons runs into the Red sea, about 18 miles S.W. from Zebid.

WADI *Zebid*, a river of Arabia, which passes by Zebid. This river, at a particular season of the year, overflows and fertilizes the soil; it afterwards spreads itself into a shallow lake, and is lost among the sands.

WADING, LUKE, in *Biography*, an Irish ecclesiastic, more distinguished for probity and piety than for discrimination of judgment, resided at Rome, where he died in the year 1655. His works, in which he has occasionally intermixed fabulous relations, are "Annals of his Order," which was that of St. Francis, in 8 vols. folio, continued by other authors till they amounted to 17 vols. folio; and a "Bibliotheca of Writers of the Franciscan Order," 1630, folio, held in considerable estimation. Moreri.

WADMELAW, in *Geography*, a river of South Carolina, which separates the island of St. John from the continent.—Also, a small island on the coast of South Carolina, which communicates with St. John's island by means of a bridge.

WADREAG, a district of Africa, in the country of Sahara.

WADSAOS, a town of Norway, in the diocese of Drontheim; 120 miles N. of Drontheim.

WADSETT, in *Agriculture*, a term applied to an ancient sort of tenure or lease of land, in the Highland parts of Scotland. The writer of the account of the agriculture of the county of Inverness has remarked, that wadsetts were, at a former period, frequent and numerous there; but that they have now been mostly resumed, the price being paid up so soon as the term of redemption arrived. These wadsetts were commonly, it is said, granted to the younger sons and near relations of the great barons, and for these

these reasons: 1st, Being more attached to the head of the tribe than any other description of men, they were appointed the officers of the clan, when an expedition was undertaken; 2d, The scarcity of money made it more convenient for the needy nobility or chieftains to borrow or raise money in this way than in any other, or to give their children a patrimony, when about to settle in life; and 3d, When every man's occupation was war, or farming and grazing, before the spirit of adventure in going abroad to acquire wealth was known, the youth remained at home, on wadsetts or leases of ground at a moderate rent. In this manner, it is said, a clan, during the patriarchal no less than the feudal system or state, were in fact a battalion of armed men, living closely together, and united by the most powerful ties of consanguinity and interest. Accordingly, it is said, we find the Highland tribes settled in clusters, in the same valley or strath, unmixed with any other people; nor was it at one period, it is thought, very safe for a stranger to attempt settling amongst them. A few, and but very few, of these redeemable rights now exist, it is asserted, in any part of the Highlands; and that if the wadsetter continue in the same possession, the right of wadsett is changed into an ordinary lease. See Tenure.

WADSOË, in *Geography*, an island in the Frozen ocean, N. lat. 70° 6', with a copious hot spring, the heat of which is about 36½° of Fahrenheit.

WADSTENA, a town of Sweden, in East Gothland, on the Wetter lake, with a castle, built by Gustavus Vasa in the year 1544, and defended at its four corners by round towers, covered with small domes. In the year 1567, this town was burned by the Danes; 20 miles W. of Linkioping. N. lat. 58° 25'. E. long. 14° 59'.

WADSWORTH, a town of New York, on the Genese river; 90 miles W.N.W. of Chenango.

WADWORTH, a township in the West Riding of Yorkshire; 5 miles N.W. of Halifax.

WAELHEIM, a town of France, in the department of the Two Nethes; 3 miles N.W. of Malines.

WAELWYK, a town of Brabant; 10 miles W.N.W. of Bois-le-Duc.

WAER, a town of Hindoostan, in the country of Agra; 20 miles W.S.W. of Fattipour.

WAERDER, a town of Holland; 5 miles N.E. of Gouda.

WAERFLIET, a town of Germany, in the county of Delmenhorst; 8 miles N. of Delmenhorst.

WAERTH, a town of France, in the department of the Lower Rhine; 9 miles S.S.W. of Wissemburg.

WAES, a district of Flanders so called, situated on the bank of the Scheldt, between Ghent and Ysendick.

WAFE. See Waif.

WAFERS for sealing letters are made by mixing fine flour with glair of eggs, isinglass, and a little yeast, and beating the mass into a paste; then spreading it when thinned with gum-water, on even tin-plates, and drying it in a stove, and cutting it for use. The different colours may be given by tinging the paste with brazil or vermillion for red; indigo, or verditer, &c. for blue; saffron, turmeric, or gamboge, &c. for yellow, &c.

WAFT, in *Sea Language*, a signal displayed from the stern of a ship for some particular purpose, by hoisting the ensign, furled up together into a long roll, to the head of its staff. It is particularly used to summon the boats off from the shore to the ship to which they belong; or as a signal for a pilot to repair aboard. Falconer.

To waft a ship, is to convoy her safe, as men of war do by merchants' ships.

WAFTERS, Waftores, conductors of vessels at sea. King Edward IV. constituted a triumvirate of officers with naval power, whom the patent styles *custodes*, *conductores*, and *waftores*; their business chiefly was to guard our fishermen on the coasts of Norfolk and Suffolk.

WAGA, or Vaga. See Weigh.

Waga, in *Botany*, H. M. a siliquous Indian tree, with a tetrapetalous stellated flower, and flat pods, three inches in length. It is very like the intsia, but without spines, and climbs about high trees. The pods are two inches in breadth, thin, and very flat; when dried, of a reddish colour, and have a cortex of a snow-white colour on the inside. The beans are astringent, bitter, round, and smooth, a little flattish, lying in a transverse position with respect to the pod, and of a green, inclining to a chesnut colour. It is evergreen, and grows in Malabar.

The juice of this tree, together with lemons and green turmeric, boiled for a considerable time in cocoa-nut oil, is a good ointment for the leprosy, and of great use in inveterate ulcers. Raii Hist. Plant. 1766.

WAGEERAH, in *Geography*, a town of Hindoostan, in Balana; 20 miles W.N.W. of Nassuck.

WAGENAAR, John, in *Biography*, a Dutch writer, distinguished by his moral qualities as well as literary acquirements, was born in 1709 at Amsterdam, of which he was appointed historiographer in 1758. He died in 1773. His principal work, which is reckoned one of the chief ornaments of Dutch literature for depth of research and purity of style, is a "History of Holland from the earliest Period till 1751," in 21 vols. 8vo.; of which a second edition with engravings, both maps and portraits, was printed at Amsterdam in 1752—1759. Among his other performances are enumerated, "An Historical Description of the City of Amsterdam," Amst. 1760, 3 vols. folio; "The Character of John De Witt placed in its true Light;" and "Historical and Political Miscellanies," Amst. 8vo. 1776. Gen. Biog.

WAGENDRISL, in *Geography*, a town of Hungary; 5 miles S. of Kapsdorf.

WAGENINGEN, a town of Holland, in the department of Guelderland, situated in a marshy country, on the north side of the river Leck, supposed to be the Vada of Tacitus, which was so stoutly defended by Julius Briganticus against his uncle Civilis, the famous Batavian general. On one side there is a large barren heath, and on the other are pleasant meadows and arable lands. It is tolerably well built, and reckoned the third town of that part of Guelderland called the "Veluwe." Its inhabitants have a pretty good trade in cattle and tobacco; 7 miles W. of Arnheim.

WAGENIZ, a town of Bohemia, in the circle of Koningingratz; 12 miles E. of Koningingratz.

WAGENSEIL, John Christopher, in *Biography*, was born at Nuremberg in 1633, and having studied at several universities, he became tutor to the son of a nobleman at Altdorf, and accompanied him in his travels through a great part of Europe. At Turin he discovered in the cabinet of the duke of Savoy the famous Isiac Table, which had been lost ever since the pillage of the duke of Mantua's cabinet. In the progress of his life he acquired a high degree of reputation, and was distinguished among other foreign literary persons by the munificence of Lewis XIV. Having been honoured with the degree of LL.D. at Orleans, he became professor of law and history in the university of Altdorf in 1667, and afterwards was advanced to the chair of Oriental languages, and the station of public librarian. He was also a member of the academies at Turin and Padua; and died at Altdorf, at the age of 72, in the year

year 1705. The most distinguished of his writings are, "A Dissertation on a supposed Fragment of Petronius;" "Fasciculus Opusculorum variorum Historicorum et Philologicorum;" "Tela ignea Satanæ," 2 vols. 4to. being a collection, with a refutation, of some of the principal Jewish works against Christianity; "Dissertatio de Monetali veterum Romanorum;" "Commentatio de Civitate Norimburgensi;" and "Dissertatio de Academiis." He had a daughter, named *Helen-Sibilla*, celebrated for her knowledge of the Latin, Greek, and Hebrew languages. Moreri.

WAGENSEIL, GEORGE CHRISTOPHER, a harpsichord master and composer at Vienna, a disciple of the learned Fouchi, first maestro di capella to the emperor. Till Emanuel Bach changed the style of playing on keyed instruments throughout Germany, Wagenseil's compositions for the harpsichord were in favour throughout Europe, and justly admired for their spirit and originality; as he had quitted the dry, laboured, and crowded style of his predecessors, and given way to fancy, with no unsuccessful attempts at new effects in his accompaniments.

Wagenseil was many years harpsichord master to the archduchess Maria Theresa, afterwards empress-queen, on which account he enjoyed a pension of 1500 florins a year. But in 1772, when we saw and heard him at Vienna, he had been confined to his room several years by a lameness, which came on by degrees in a very uncommon manner. The sinews of his right thigh were contracted, and the circulation stopt, so that it was become incurably withered and useless. Besides this calamity, which constantly confined him to his couch, his left hand had been so ill treated by the gout, that he was hardly able to move two of his fingers. However, at our urgent request, he had a harpsichord wheeled to him, and played several capricios, and pieces of his own composition, in a very spirited and masterly manner; and though we could certainly believe that he had been a much greater player, yet he had sufficient fire and fancy remaining to please and entertain, though not to surprise us very much.

He was at this time nominal master to the archduchesses, for which he had a small pension. Though utterly unable to quit his room, he had scholars who attended him there; and he continued to compose for foreign countries, where his fame was established by his early compositions.

In a second visit which we made this worthy and ingenious man, he had with him a little girl, his scholar, about eleven or twelve years old, with whom he played duets on two harpsichords, which had a very good effect. The child's performance was very neat and steady. There was a young count with him at this time, another of his scholars, who had a very rapid finger, and executed some very difficult harpsichord lessons with great precision.

Wagenseil, with all his corporeal complaints and infirmities, was allowed very extraordinary longevity; as, according to Gerber (Hist. and Biogr. Lexicon), he lived till 1777, when he had arrived at his 92d year.

We never heard of more than three vocal compositions by this composer, which were an oratorio, "Gioas Re di Gruda," written by Metastasio, and two cantatas for the imperial court, by the same author; but for the harpsichord, nine different works of his composition were published in different capitals of Europe, some with and some without accompaniments; which, like their author, were allowed to live longer than usual.

WAGER, WAGING, in *Law*, *vadari*, signifies the giving of security for the performance of any thing.

Thus, to wage law, is to put in security, that you will make law at the day assigned, *i. e.* take the benefit which the law has allowed you.

Our ancestors considered, that there were many cases in which an innocent man, of good credit, might be overborne by a multitude of false witnesses; and, therefore, established this species of trial, by the oath of the defendant himself. This method of trial is not only to be found in the codes of almost all the northern nations that broke in upon the Roman empire, and established petty kingdoms upon its ruins, but its original may be traced back as far as the Mosaical law. Exod. xxii. 10.

A manifest resemblance may also be discerned between this species of trial, and the *canonical purgation* of the Popish clergy, when accused of any capital crime. Similar to this is also the *sacramentum decisionis* of the civil law. But, though a custom somewhat like this prevailed formerly in the city of London, yet in general the English law does not thus, like the civil, reduce the defendant, in case he is in the wrong, to the dilemma of either confession or perjury.

The manner of waging and making law is this. He that has waged, or given security, to make his law, brings with him into court eleven of his neighbours; a custom which is particularly described so early as the league between Alfred and Guthrun the Dane. The defendant then, standing at the end of the bar, is admonished by the judges of the nature and danger of a false oath; and if he still persists, he is to repeat this or the like oath: "Hear this, ye justices, that I do not owe unto Richard Jones the sum of ten pounds, nor any penny thereof, in manner and form as the said R. hath declared against me. So help me God." And thereupon his eleven neighbours, or compurgators, shall avow upon their oaths, that they believe in their consciences that he says the truth; so that himself must be sworn *de fidelitate*, and the eleven *de credulitate*. Some have maintained, that fewer than eleven compurgators will suffice; but sir Edward Coke is positive, that there must be this number; and his opinion is approved and supported by judge Blackstone, who observes, that as wager of law is equivalent to a verdict in the defendant's favour, it ought to be established by the same or equal testimony, namely, by the oath of twelve men.

In the old Swedish or Gothic constitution, wager of law was not only permitted, as it still is in criminal cases, unless the fact be extremely clear against the prisoner, but was also absolutely required in many civil cases. But with us in England, wager of law is never required; and is then only admitted, where an action is brought upon such matters as may be supposed to be privately transacted between the parties, and in which the defendant may be presumed to have made satisfaction without being able to prove it; as in actions of debt upon simple contract, or for an amercement in actions of detinue and of account, where the debt may have been paid, the goods restored, or the account balanced, without any evidence of either; and not, when there is any specialty, as a bond or deed to charge the defendant, but when the debt groweth by word only. Nor doth it lie in an action of debt, for arrears of an account, settled by auditors in a former action. By such wager of law, when admitted, the plaintiff is perpetually barred; for the law, in the simplicity of ancient times, presumed, that no one would forswear himself, for any worldly consideration. Wager of law, however, lieth in a real action, where the tenant alleges he was not legally summoned to appear, as well as in mere personal contracts. A man outlawed, attainted for false verdict, or for conspiracy or perjury, or otherwise become infamous, shall not be permitted to wage his law. Neither shall an infant under the age of twenty-one,

one, for he cannot be admitted to his oath; nor shall the defendant, where the plaintiff is an infant, wage his law. But a feme-covert, when joined with her husband, may be allowed to wage her law; and an alien shall do it in his own language. It is, moreover, a rule, that where a man is compellable by law to do any thing, by which he becomes creditor to another, the defendant in that case shall not be admitted to wage his law; for then it would be in the power of any bad man to run in debt first, against the inclinations of his creditor, and afterwards to swear it away. But where the plaintiff hath given voluntary credit to the defendant, there he may wage his law. In no case where a contempt, trespass, deceit, or any injury with force is alleged against the defendant, is he permitted to wage his law. Executors and administrators, when charged for the debt of the deceased, shall not be admitted to wage their law. The king also has his prerogative; for, as all wagers of law import a reflection on the plaintiff for dishonesty, therefore there shall be no such wager on actions brought by him; and this prerogative extends and is communicated to his debtor and accomptant; for, on a writ of *quo minus*, in the exchequer for a debt on simple contract, the defendant is not allowed to wage his law.

Notwithstanding all the restrictions to which wagers of law were subject, it was at length considered, that it threw too great a temptation in the way of indigent or profligate men; and, therefore, by degrees new remedies were devised, and new forms of action were introduced, in which no defendant is at liberty to wage his law; so that wager of law is quite out of use, being avoided by the mode of bringing the action; but still it is not out of force. And, therefore, when a new statute inflicts a penalty, and gives an action of debt for recovering it, it is usual to add, in which no wager of law shall be allowed: otherwise a hardy delinquent might escape any penalty of the law, by swearing he had never incurred, or else had discharged it. Blackst. Comm. book iii.

WAGER *of Battle*. See BATTLE and DUEL, &c.

WAGER'S *Straits*, or *River*, in *Geography*, a river of North America, which empties itself into Hudson's bay, N. lat. 65° 8'. W. long. 87°.

WAGES, the plural of the obsolete singular *wage*, denote the pay or recompence given, according to custom, stipulation, and enactment of law, for any kind of work or service. (See LABOUR, LABOURER, and SERVANT.) As disputes have often occurred between masters and servants, the law has interposed to fix the wages of those that are employed in various departments of service. Accordingly by 5 Eliz. c. 4. the justices of every shire, riding, and liberty, or the major part of them, the sheriff, and every mayor, and other head officer within any city or town corporate, in which is any justice of the peace within the limits of the said city or town corporate, and of the said corporation, shall yearly in Easter sessions, or within six weeks afterward, assemble such discreet persons as they shall think meet, and having respect to the plenty or scarcity of the time, and other circumstances, shall have authority to limit, rate, and appoint the wages as well of such artificers, handicraftsmen, husbandmen, or any other labourer, servant, or workman, whose wages in time past have been by any law rated and appointed, as also the wages of all other labourers, artificers, workmen, or apprentices of husbandry, which have not been rated, as they shall think meet by their discretions, to be rated, limited, or appointed, by the year, or by the day, week, month, or otherwise, with or without meat and drink, and what wages every workman or labourer shall take by the great for mowing, reaping, or thrashing of corn and grain, or for mowing and making of hay, or for ditching, paving, railing, or hedging, by the rod, perch, lugg, yard, pole, rope, or foot, and for any other kind of reasonable labour or service. Also, by 1 Jac. c. 6. the justices, or major part of them, resiant in any riding, liberty, or division, where the sessions are severally kept, shall have power to rate the wages within such divisions, as if the same were done in the general sessions of the county; and by the said statute, the said act of 5 Eliz. shall extend to the rating of wages of all labourers, weavers, spinsters, and workmen or workwomen, whatsoever, either working by the day, week, month, or year, or taking any work by the great or otherwise.

If any justice resiant within the county, or mayor, shall be absent at the rating of wages, and not hindered by sickness or other lawful cause to be allowed by the justices then assembled for rating of wages, upon the oath and affidavit of some credible person, he shall forfeit to the king 10*l*. to be recovered in the sessions or other court of record, by indictment or otherwise.

And the justices shall yearly, between September 29 and December 25, and between March 25 and June 24, make special and diligent enquiry of the good execution of this statute, and punish defaulters; and shall have for every day that they sit about the execution thereof (not exceeding three days at a time) 5*s*. each out of the forfeitures due to the king.

By the aforesaid act of 5 Eliz. the rates were to be certified into the chancery; but by the 1 Jac. c. 6. they need not to be certified into the chancery, but shall be kept amongst the records of the county or town corporate.

And after the said rates are made and engrossed in parchment under the hands and seals of the persons having authority to rate the same, the sheriff or mayor may cause proclamation thereof to be made in so many places as to them shall seem convenient, and every person shall be bound to observe the same.

If any person upon the proclamation published shall directly or indirectly retain or keep any servant, workman, or labourer, or shall give any more or greater wages, or other commodity, than shall be so appointed in the said proclamation; he shall on conviction before any of the justices or other head officers above mentioned be imprisoned for ten days without bail, and shall forfeit 5*l*.; half to the king, and half to him that shall sue before the said justices in their sessions.

But yet masters may reward a well-deserving servant over and above his wages, according as he shall deserve, so it be not by way of promise or agreement upon his retainder.

And every person that shall be so retained and take wages contrary to the said statute of the 5 Eliz. or to the said proclamation, and shall be thereof convicted before the justices aforesaid, or any two of them, or before the mayor or other head officers aforesaid, shall be imprisoned for 21 days without bail.

Every retainer, promise, gift, or payment of wages, or other thing contrary to the said act, and every writing and bond to be made for that purpose, shall be void.

If any clothier, or other, shall refuse to pay so much wages to their weavers, spinsters, workmen, or workwomen, as shall be rated, and be convicted thereof by confession, or oath of two witnesses, at the assizes, or sessions, or before any two justices (1 *Q*.); he shall forfeit 10*s*. to the party grieved, to be levied by distress and sale.

All artificers and labourers, being hired for wages by the day or week, shall, betwixt the midst of March and midst of September, be and continue at their work from five in the morning till after seven at night (except in the time of break-

fast,

faft, dinner, or drinking, which fhall not exceed two hours and an half in a day, that is to fay, at every drinking, one half hour, for his dinner one hour, and for his fleep, when he is allowed to fleep, that is, from the midft of May to the midft of Auguft, half an hour at the moft, and at every breakfaft one half hour:) and all the artificers and labourers between the midft of September and the midft of March fhall be and continue at their work, from the fpring of the day in the morning until night, except it be in the time before appointed for breakfaft and dinner; on pain to forfeit 1*d.* for every hour's abfence, to be deducted out of their wages.

And every artificer and labourer lawfully retained in building or repairing any church, houfe, fhip, mill, or other piece of work taken in great, in tafk, or in grofs, or who fhall take upon him to make or finifh any fuch thing or work, fhall continue and not depart therefrom (unlefs for non-payment of the wages or hire agreed on, or appointed to ferve the king, or other lawful caufe, or without licenfe from the mafter or owner of the work, or of him that hath the charge thereof,) before the finifhing thereof, on pain of imprifonment by one month, without bail, and forfeiture of 5*l.* to the party from whom he fhall fo depart, recoverable by action of debt in any court of record; befides fuch ordinary cofts and damages as may be recovered by the common laws for any fuch offence.

We fhall here obferve, that the firft ftatute, regulating the wages of labour in England, paffed in the reign of Edward III.; and in the fame year (1351) the earlieft law in Spain on the fame fubject was publifhed by Peter the Cruel. At an earlier period, labourers were ferfs, and confequently no laws were required to regulate their wages. The immediate caufe of the laws paffed in both countries, in the middle of the 14th century, was the plague which laid wafte Europe from 1347 to 1349, and carried off a great portion of its inhabitants. The confequence of this devaftation was a fcarcity of labourers, and a rife in the price of labour; which alarmed the employers of labourers both in Spain and in England, and induced them, in their legiflative capacity, to enact laws, which reduced the price of labour to its former ftandard, and impofed heavy penalties on all who gave or accepted more. A few years probably reftored Europe to its former population, and rendered thefe laws fuperfluous; but they ferved as examples to future times, and encouraged governments to interfere and regulate the wages of their fubjects. In England, the ftatute of labourers was frequently renewed, with fuch alterations as the change of circumftances required; and, by an equitable provifion, the juftices of every county were empowered, by the ftatute 13 Richard II. c. 8. to meet once a year between Eafter and Michaelmas; and after taking into confideration the price of provifions, to regulate, by proclamation, the wages that fhould be received in the enfuing year. But though this power was confirmed to the juftices by the ftatute 5 Eliz. c. 4. they feem to have exercifed it fparingly; and, when they acted, to have been guided by a fteady bias in favour of the mafters.

By the ftatute 11 Henry VII. c. 22. a common labourer was allowed 4*d.* a day, without diet, from Eafter to Michaelmas. In the 35th of Elizabeth the juftices in the Eaft Riding of Yorkfhire, determined that the wages of the common labourer, without meat or drink, fhould be limited to 5*d.* a day, from the 1ft of March to the feaft of All Saints. At the former period, a labourer who had 4*d.* a day could earn a quarter of wheat (at 6*s.* 8*d.* its price) by 20 days labour, a quarter of rye (at 4*s.*) by 12 days labour, and a quarter of barley (at 3*s.*) by 9 days labour. At the latter period, or in the latter part of the reign of queen Elizabeth, a common labourer could not earn a quarter of wheat (at 20*s.*) by lefs than 48 days labour, nor a quarter of rye (at 13*s.* 4*d.*) in lefs than 32 days, nor a quarter of barley (at 12*s.*) in lefs than 28$\frac{4}{5}$ days. In other words, a common labourer could earn a greater quantity of wheat in 1495, than he could of barley in 1593. If, therefore, barley was his common fuftenance, he could earn more than three times as much in 1495 as in 1593; if rye, 2$\frac{2}{3}$ as much; and if wheat, 2$\frac{2}{5}$. Confequently, as far as the neceffaries of life are concerned, the fituation of the labourer was not one-half fo advantageous in 1593 as it had been in 1495. In the interval, America had been difcovered, the precious metals depreciated throughout Europe, and the currency of England deteriorated by the operations of the government.

A change in the value of money, fimilar to what happened in the 16th century, has taken place in our own times. The precious metals have been depreciated throughout Europe, in confequence of the increafed productivenefs of the American mines during the laft 40 years; and in our own country, the rife of prices, which this neceffarily produced, has been aggravated by a depreciation of our currency, occafioned by the exceffive iffue of paper not convertible into fpecie. What have been the confequences? The price of labour has not rifen in proportion to the rife of commodities. But the labourer has the difference made up to him in the fhape of poor's rate. An unmarried man can ftill fupport himfelf by his nominal wages. But a married man, who has two children to maintain, receives as a matter of courfe affiftance from his parifh. A calculation is made of his wages, and of the price of bread. So much bread is allowed to him, according to the number of his family. What his wages will not furnifh, the parifh provides. This beneficent fyftem, as it has been called, turns out to be an engine in the hands of mafters, to keep wages as low as will fuffice for the maintenance of the labourer and his wife, with a provifion in the fhape of charity for the fupport of his children. It cannot be doubted, that if fuch a provifion had never exifted, the wages of the labourer would have been higher—that what he now receives as charity, he would then have received as his own—and that the operation of this fcheme of benevolence is to increafe the gains of the rich, and to deprive the poor of that fhare in the good things of this life, which the provifions of nature, and their own induftry, might otherwife have given them. In thus keeping down the wages of labour, the poor-laws have accomplifhed, under the mafk of charity, what the old ftatute of labourers had vainly attempted by the infliction of pains and penalties.

Wages, in *Agriculture*, a term employed to fignify the price or hire which is paid to fervants or labourers for the performance of different kinds of farm-work. It is noticed in the Report on the Agriculture of the County of Peebles, in Scotland, that the demand for labour, as for every other marketable article, neceffarily varies according to circumftances; and that the price muft, of neceffity, be regulated by the proportion between the exifting quantity of the article and the demand. That where capital, and profitable employment for capital, abound in proportion to the population, the demand for, and confequent reward of labour, will neceffarily rife to the higheft rate; but that the reverfe muft as neceffarily enfue upon the oppofite fuppofition. That if, in the former cafe, it fhould be attempted to lower the wages of labour below what the demand can afford, the competition of employers, poffeffed of capital, would lead them to break through, or evade, all fuch regulations. If, in the latter cafe, it fhould be attempted to raife wages above

above what the demand can allow, the competition of labourers for employment would beat them down, avowedly or secretly, to their natural market price. And that the only effect of such nugatory regulations, must issue in the occasioning of more or less embarrassment, in the contrivance of evasions to escape the penalties of their contravention.

Indeed, in the above way alone, it is said, could the existing capital in employment be equally diffused among the labourers of a country, so as that each should receive his proper share of it, in proportion to his willingness and ability to work: if it were possible to carry into effect any regulations for raising wages to an higher rate, the infallible consequence must be, it is thought, that the distribution of the above noticed capital would be confined to a smaller number of labourers, and that the remainder could get no work or employment, and must therefore subsist on charity. But that if the charity comes exclusively from the pockets of those possessed of capital, the capital, thus shortened, is able to employ still fewer at the regulated rate: if it comes, in part, from the employed labourers, it is to them, it is said, all one whether this diminution of wages arises from their giving it in charity to the idle, or from its being taken from them through the competition of the industrious.

The writer of the corrected account of the Agriculture of Middlesex, too, states, that the high value of the landed estates of this country depends very much upon the low price of labour: that if the farmers could have their work executed for one moiety of the present cost, other things remaining the same, it would enable them to pay a much higher rent for the land which they hold. Supposing the labour of land, it is said, to be twenty shillings an acre, in case this could be reduced to ten shillings, proprietors might then add fifty *per cent.*, it is thought, to their rentals, and that the farmers could pay such increased rent, with more convenience to themselves, than they can pay their present rents at the present price of labour. The rent of land is, it is said, about fourteen shillings an acre; if the price of labour could be lowered ten shillings, the farmer, by adding fifty *per cent.* to his rent, would pay his landlord seven shillings, it is said, and increase his own profits three shillings. That, on the other hand, if, by any means, the price of labour should be increased from twenty to twenty-four shillings *per* acre, the rent would, it is said, be absorbed in the price of the labour, in which state of things the landlord would be unable to procure any rent. The then (1807) price of labour, and rent of land, being as much as the farmer can afford to pay; increasing the labour at once, so much as to be equal to the present labour and rent, would, it is supposed, reduce the rent to nothing. It would seem to be evident, it is thought, that an addition to the then price of labour of about seventy *per cent.* would annihilate the rental of land. It is consequently asked, if the advocates for increasing the price of labour or rate of wages, are aware of the evil tendency of their arguments and opinions? have they, it is enquired, contemplated the distress which would take place, if the land should not produce any rent?

Advancing the hire of labour, without, at the same time, increasing the price of the produce of land, would create, it is supposed, a struggle of short duration between the landlords and the farmers, which would reduce the former to farmers, and the latter to labourers. The labouring class would be inordinately increased in number, and the work to be done greatly reduced in quantity. The former would be employed two or three days in a week; this would create a competition among the labourers to obtain constant work, which could only be done by working for less money than usual; the price of labour would fall greatly below what it was at this time; the land would be imperfectly cultivated, and the agricultural part of the nation would be thrown, it is said, some hundred years back.

Every advance in the cost of agricultural labour must, it is said, be paid either by the community or the landlords. If grain and animal food are made to advance in price, in order to enable the farmers to pay additional wages to their labourers, it becomes a tax, it is said, on the community, and to which those identical labourers contribute. If the price of grain and animal food should continue stationary, and labour should increase in price, it will infallibly, it is thought, occasion an equivalent deduction in the rents of the land. It is of high importance, it is contended, to the landed interest, that the labourers in agriculture should be fed at a very low rate of expence. Any material increase of the wages of labour can only be made, without doing great injustice to the landlords, by a proportionate advance, it is said, in the prices of grain and cattle.

The writer would feel much satisfaction at measures being taken to increase the price of labour, and ameliorate the condition of the workmen of the country, if it could be accomplished without greatly injuring the nation, and particularly if it could be effected without any material interruption to the progress of science, of arts, and of commerce. But the success of agriculture, manufactures, and commerce, all depend upon the price of labour being low, even very low: in order that our arts and our commerce should be highly successful, the price of labour, it is maintained, should be low as possible.

It is further remarked, that the circumstances of the country have of late, until within this little while, made greater calls than usual on the labouring class; the consequence of which has been, what under similar causes always will be the case, an advance in the wages of labour. At the former price of corn, that would have lowered the rent of land, which would, it is said, have fallen exclusively on the landed interest; therefore, to prevent so considerable an inconvenience, the corn laws and regulations have been altered in such a manner as to allow the price to rise. The same able writer, in speaking of the bad effects of public-houses on labourers, remarks it as almost a general rule, that the higher their wages are, the less they carry home, and consequently, the greater is the wretchedness of themselves and their families. Comforts in a cottage are mostly found, it is said, where the man's wages are low, at least so low as to require him to labour six days in every week. For instance, a good workman, at nine shillings *per* week, if advanced to twelve, will spend a day in the week at the alehouse, which reduces his labour to five days, or ten shillings; and as he will spend two shillings in the public-house, it leaves but eight shillings for his family, which is one less than they had when he earned only nine shillings. And that if by any means he be put into a situation of earning eighteen shillings in six days, he will get drunk, it is said, on Sunday and Monday, and go to his work in a stupid state on the Tuesday; and should he be a mechanical journeyman of some genius, who by constant labour could earn twenty-four shillings or thirty shillings *per* week, as some of them can, he will be intoxicated half the week, insolent to his employer and every one about him. Further, too, should his master have business in hand that requires particular dispatch, he will then, more than at any other time, be absent from his work, and his wife and children will experience the extreme of hunger, rags, and cold.

It has also been suggested by Mr. Ruggles in another situation, that if greater wages are given, they will be given for expences in articles widely different from the necessaries of life

life — they will be given for the encouragement of idleneſs, and for the increaſe of the exciſe revenue. Idleneſs is the root of all evil, it is ſaid; — articles of exciſe are the moiſture which nouriſhes that root.

The increaſing number of public-houſes is conſequently to be greatly deplored as it operates in this way. As there the poor and thoughtleſs labourers are irreſiſtibly, it is ſaid, tempted to ſquander their money, in bad beer and ſpirits, to the manifeſt injury of their conſtitutions; whereas, it is thought, a ſubſtantial meal at home, with a little good ale, would enſure that health and vigour ſo eſſential to thoſe who muſt earn their bread by the ſweat of their brows. It cannot but be noticed, it is ſaid, that the *increaſe* of theſe ſorts of houſes is *more* ruinous to the loweſt orders of ſociety than *all* other evils put together. The depravity of morals, and the frequent diſtreſs of the poor labourers' families, if traced to their true ſource, would, it is thought, be generally found to originate in the public-houſe. That, on the contrary, where there is not ſuch a houſe in the pariſh, and ſome ſuch pariſhes there ſtill are, though in diſtant ſituations, the wife and children of the labourer, generally ſpeaking, it is ſaid, enjoy happineſs, compared with thoſe where many public-houſes are ſeen. They are alſo, it is thought, leſs diſpoſed to deceive and pilfer; are better clothed, more cleanly in their perſons, and agreeable in their manners.

In all caſes, a great deal more, probably, depends upon the manner of training and bringing up the working claſs than is commonly ſuppoſed; as where they are taught and accuſtomed from infancy to depend upon themſelves and their own induſtry, exertion, hard labour, and honeſty, they will form much better and more orderly ſervants and labourers than where they are made to place their dependance, from ſuch an early period, on the bounty or charity of others, as is too much the caſe, without having the example of ſuch habits of honeſt induſtry, exertion, and independance before them. A better, more induſtrious, and ſuitable mode of educating and bringing up the children of the labouring poor, is indeed a matter which is much to be deſired.

The wages of ſervants and labourers differ greatly, in different diſtricts and ſituations, as the nature of them may be, and according to the goodneſs or indifference of the workmen they may contain, but in all they have conſiderably increaſed for the laſt fifteen or twenty years, except very lately. They may, perhaps, be ſtated, as varying under different circumſtances, from eight or nine to ſixteen or eighteen ſhillings by the week, and from eight or nine pounds to fourteen or fifteen by the year. This is nearly the caſe in the two great arable diſtricts of Eſſex and Norfolk.

However, in addition to the ſtipulated wages, the labourers have often other advantages from their employers, ſuch as corn or meal at a reduced price, pieces of potatoe grounds or gardens, cow grounds, or cows kept, ſmall houſes, and many others, which increaſe the real, though not the nominal wages.

A plan and form of book for regulating and keeping an account of the time and wages of all ſorts of work-people employed by the day, or in other ways, have lately been prepared and printed at Liverpool, by which, it is ſaid, the trouble of arranging and managing ſuch accounts will not be a tenth of what it is in the uſual modes of proceeding in ſuch buſineſs. If theſe means ſhould be found capable of leſſening the difficulty and trouble of this ſort of accounts on a full trial, they will certainly be of great utility in many departments of labour, as ſomething of this ſort has long been wanting.

WAGGAMAW, in *Geography*, a lake of North Carolina; 30 miles S.W. of Exeter.—Alſo, a river of North Carolina, which runs into the Great Pedee, 15 miles S. of Kingſton, in South Carolina.

WAGGEL, in *Ornithology*, a name given by the people of Cornwall to a ſpecies of the *larus*, or ſea-gull, known among authors by the name of *martinazzo*.

WAGGON, in *Agriculture* and *Rural Economy*, a kind of vehicle or carriage in common uſe. There are divers forms of waggons, accommodated to the divers uſes they are intended for. The common waggon conſiſts of the *ſhafts*, or *rads*, which are the two pieces the hind horſe bears up; the *welds*; the *ſlotes*, which are the croſs pieces that hold the ſhafts together; the *bolſter*, being that part on which the fore-wheels and axle-tree turn, in wheeling the waggon acroſs the road; the *cheſt*, or body of the waggon, having the ſtaves or rails fixed thereon; the *bales*, or hoops, which compoſe the top; the *tilt*, the cloth thrown over the hoops; beſides the *wheels*, *axle-tree*, &c.

Waggons are too frequently conſtructed without that proper attention to the nature of the roads, or the ſorts of articles which are to be conveyed by them, which is neceſſary, being in general heavy, clumſy, and inconvenient conveyances. There is, however, a waggon of this kind, which is much employed in the county of Berks, that is formed and built on a more ſimple and convenient principle than thoſe commonly met with in moſt other ſouthern parts of the country, and which has not either the height or weight of them, while it poſſeſſes ſufficient ſtrength, and is eaſy in the draught. The writer of the firſt account of the agriculture of that diſtrict has, however, ſuggeſted an improvement to be made in it, which is that of leaving the ſpace ſufficiently deep in the body or bed for the fore-wheels to lock round in the ſhorteſt poſſible curve, as in the preſent manner of its conſtruction, a great deal of time is neceſſarily loſt in the turning at the ends of the ſwaths and plats in carrying hay or corn, as well as on ſome other occaſions, as in this way the inconvenience may be removed without doing the ſmalleſt injury, it is ſaid, to the ſymmetry or ſtrength of the carriage or waggon.

In the corrected report on the agriculture of that diſtrict, which has been more lately drawn up, it is however noticed, that ſome farmers of the foreſt part remark on the above, that the waggon would be much weakened by the propoſed alteration; and add, that an improvement has lately been made on the waggons of this county, which is found to anſwer the purpoſe of the above ſuggeſted alteration, which is the locking chain, as it is called; which is a chain from the pillar of the waggon, to about ſix inches before the middle bed ſtay, which is made of ſuch a length, as effectually to prevent the waggon catching on the lock. Where the beds of the waggons are ſtraight, as is common, it is ſaid, in the ſouthern parts of the ſame county, the improvement firſt propoſed would probably, it is thought, be uſeful; but that in the vale and middle parts, the beds are otherwiſe conſtructed, and ſcarcely admit of alteration for the better.

A waggon, too, which is peculiar to Cornwall, is ſaid to be light and elegant, being uſed there for carrying corn and hay in harveſt time, and faggot-wood, as well as for many other purpoſes. The body is open, which with a lade of five bars fixed before and behind gives it great length, while an arch put over the hind wheels gives it breadth; the fore-wheels turn clear under the body, ſo that it can ſweep round in a very narrow compaſs; the load is ſecured by two ropes tightened by a ſort of winch fixed behind the waggon; it carries about three hundred ſheaves of corn at a time. A tongue tree, ſometimes called a middle tree, or ſhafts, are occa-

occasionally fixed to the axle of the fore wheels, according as it is intended to be drawn by an ox or a horse-team. This light waggon is thought to be deserving of a place on almost every large farm in the kingdom.

But the writer of the rural economies of the different counties of the kingdom, who has attended much to the subject, thinks that those which are employed in the county of Gloucester are to be preferred to any others in the country; as by means of crooked side rails, bending archwise over the hind wheels, the bodies or frames of them are kept low, without the diameter of the wheels being much lessened. The bodies are likewise, it is said, made wide in proportion to their shallowness, and the wheels run six inches wider than those of most other waggons, whereby advantages in carrying top-loads are, it is said, evidently obtained. Mr. Rudge, too, in his account of the agriculture of the same district, has remarked that, in many parts of it, waggons are the principal carriages employed in getting in the hay and corn, and are either full-bedded or with three-quarter beds. That the former have the advantage of a greater length of bed, but are not so convenient for turning; and that the latter, though diminished in size, have the convenience of locking the fore wheels, and turning in almost as narrow a compass as a chaise, in consequence of the bed being hollowed out on each side near the middle, to admit the exterior part, or felloes of the fore wheels. Both these sorts of waggons are capable of carrying nearly, it is said, the same weight, though the former, as being deeper in the bed, is somewhat better adapted, it is thought, for the carriage of heavy articles, such as bags of corn, and other such materials. For the purpose of carrying hay and straw, or of harvesting, their length and width are, it is said, increased by light ladders before and behind, and of similar contrivances, called "rathes," the whole length of the sides. The ladders are put on and taken off at pleasure in both kinds, but the side additions are generally fixed; except in the straight-headed sort, which are in use, it is said, on the western side of the Severn, in this county; in these they are made removeable, so as to leave the bed quite naked.

Another sort of waggon, which partakes, in some measure, of the properties of both the waggon and cart, on which account it has been appropriately denominated the *hermaphrodite*, is, it is said, frequently made use of in the county of Norfolk, when the pair of fore wheels and shafts are occasionally attached to a common cart by a pole connected with the axle, to which are added the ladders. This is, it is said, a light, cheap, and convenient sort of waggon, which is capable of carrying nearly as much hay or straw as that of the Berkshire.

As it has been observed, that from its having been long a complaint among large farmers, and others, whose business requires the constant use of carts, and only the occasional use of waggons, that the waggon, however well preserved by a shed or other such building, is daily decaying and getting worse while out of use, particularly the iron work of it, which is shortly destroyed by rust; and that, in like manner too, with those whose concerns require the almost constant use of waggons, and but the occasional use of carts; the la..er, while unemployed, bear a very considerable proportion to the wear and tear of carts which are in constant use: these circumstances and effects have led and induced a Mr. Rood to devise and bring to perfection, at a very considerable expence, a contrivance of this particular kind, by which the same carriage may, in a few minutes, be made by the carter into two complete tip carts of the common dimensions, and applicable to all the uses of carts in general, or into one waggon, so complete, that a narrow inspection is, it is said, necessary to distinguish it from a common waggon. And that there is no complication of parts in this waggon, the whole being so contrived, that none of its parts are ever out of use, consequently not liable to be mislaid or lost. The carts, too, when it is formed into them, have a contrivance by which to render them more safe and easy to the horse in going down a hill, and have moveable side ladders, which will, it is said, be found of great use in carrying corn, bark, and other such materials. It is noticed, that it may be constructed by the wheelwrights of any county or district with perfect ease and facility, and that its shape and particular dimensions are capable of being suited to the wishes of the owner, or to the local fashion of the neighbourhood in which he lives. That the result of considerable experience and enquiries enables the inventor to state that it may be completed, in any county or district, for about five pounds more than the cost of two common carts. It is admitted, however, that it is somewhat more clumsy than a common waggon.

It is united and held together by four strong pins, which are to be removed when it is disunited and used in the separated state.

A representation of it may be seen in the second volume of the "General Dictionary of Agriculture and Husbandry."

In the county of Norfolk, Mr. Douton, of Brandon, according to the writer of the corrected report on the agriculture of that district, has found a considerable saving by the use of light caravan waggons for two horses abreast, with which he carries, it is said, a chaldron and half of coals, and other loads in proportion; and that, it is thought by him, every man, who reduces the teams of any county or district, will be sure to do this until he arrives at perfection in a one-horse carriage.

In most counties, however, still much too heavy carriages of the waggon kind are in use for the business of farming as well as road purposes. In Kent, the carriages of this sort employed in conveying the corn to market and other places are large, and called hutches, being drawn by four horses; and generally loaded with not more than from seven to twelve quarters of corn, according to its weight, and the distance it is to be carried. They are thirteen feet long, are made crooked at the sides, the width cannot however be positively ascertained; but they are generally three feet wide before, and four behind at the bottom; and about six or eight inches wider at the top, being twenty inches deep: they are boarded at the sides and ends close enough to carry sand. If made with wooden axle-trees, they cost, it is said, about twenty guineas: if with iron, twenty-five. Such waggons are, however, quite unfit for many farm uses.

In Staffordshire, it has been observed by Mr. Pitt, that the reduction of the weight of waggons, in most cases, but particularly to those who are common carriers, is highly beneficial, being a gain of not less than fifty pounds a year by each team constantly employed on the road; and that if it be made with good materials a light waggon will last as long as a heavy one. The cost of a narrow-wheeled waggon there is twenty-six pounds; six inch, thirty-six; the axletree is most commonly of wood.

The author of the "Present State of Agriculture and Husbandry in Great Britain," remarks that waggons are chiefly used in getting in the hay and corn h..rvests, carrying the hay and grain to market, and bringing manure and coals from a distance. That they are generally drawn by the whole team on the farm, where one only is kept, whatever number of animals it may consist of, and that two men and

and a boy are mostly necessary to attend them. That in performing distant carriages, when the roads are level and substantially made, and the waggons at all times fully loaded, one of them may probably be as advantageously used as two or more carts of less dimensions. But that where the labour is required to be performed with expedition, as in the hay and corn harvests, these unwieldy machines and contrivances are without doubt ill calculated for the purpose; and that on every occasion, when they return half or a third loaded, it is evident the farmer sustains a considerable loss. Instances have occurred to the writer, it is said, in more than one open-field parish in this part of the country, where a waggon, with three or four persons and as many horses, has been dispatched to collect and carry home scattered parcels of hay from the ends of ridges, which, after going over a great extent of the parish or district, returned only partly loaded. Considering the very high rate of labour, and the shamefully extravagant manner in which, in hay or corn harvest, labourers and farm servants are maintained in this part of the kingdom, it is surprising, it is thought, that every farmer does not exert himself to devise and find out means by which he may perform his work with greater expedition, and at less expence. There are some, however, who think that this sort of carriage or conveyance, however well formed and constructed, from its necessary great weight and unwieldiness, as well as its expence, is mostly far from being advantageous to the interest of the farmer; as while it is highly destructive to the roads, it requires great power to draw it, which must be procured at much cost, without affording an adequate compensation in the increased quantity of materials which it carries.

Waggons unquestionably require much more power in the draught in proportion than carts, which is certainly a material objection against them, though they are capable of conveying a much greater load; but, besides, they are far from being so handy and convenient for many sorts of farm-work; and some too are of opinion that more business may be done in any particular space of time, with the same number of horses, by carts than by waggons, in the general run of husbandry work, especially where the distance is small between the places of loading and unloading. That where waggons are used for farm-work, they should be made wide and low, as the most suitable in different intentions. Manures may be carried in these sorts of waggons almost as well, it is supposed, as in carts. Broad wheels are improper for passing and repassing upon tillage lands; as if in fallow they press the land too much, making it so hard as to prevent its being ploughed until wet comes; but on grass-land, wheels of the broad kind are proper and suitable for all purposes. In Berkshire, Mr. Loveden is said to put narrow fore-wheels to his waggons, and broad ones behind, in order to prevent injury to tender grass-land. The hind-wheels in this way roll over the tracks made by the fore, and remove the mischief they have done. The method is thought to be excellent, and of very easy application.

On the whole, waggons are probably the most proper and suitable sort of conveyances for different kinds of heavy loads that are to be carried to a distance; but that for home uses, especially field and other work, which requires to be executed in a speedy manner, carts with proper shelvings and other conveniences are to be preferred, as more ready and economical. See Cart.

In the work of reducing the weight of waggons for farm uses, as well as for road and other purposes, it should always be done with much care and attention, in order that it may be taken from such parts of them as have not great force of draught or pressure upon them, and that those parts which are much exposed in these ways may be left sufficiently strong. In the weight and shape of the wheels some reduction and alteration may likewise take place, as may be seen in speaking of wheels. See Wheel.

Waggon, in the *Military Economy*, is a four-wheeled carriage, drawn by four horses, and applied to various purposes.

Waggon, *Ammunition*, in *Military Language*, is a waggon used in carrying all kinds of stores, and also bread; for which purpose it is lined on the inside with basket-work.

Waggon-*Master-General* is he who has the ordering and marching of the baggage of the army. On a day of march he meets the baggage at the place appointed in the orders, and marshals it according to the rank of the brigade or regiment each waggon belongs to, which is sometimes in one column, sometimes in two; sometimes after the artillery; and sometimes the baggage of each column follows their respective column.

Waggon-*Way*, the same with Rail-*Way*; which see.

WAGGONER, in *Astronomy*, a kind of constellation, called also Charles's wain.

Waggoner is also used for a routier, or book of charts, describing the seas, their coasts, &c.

Waggoner, in farm work, the person or labourer who has the care and management of the waggon teams in driving, feeding, and other ways. It is of considerable advantage to the farmer to have good and careful waggoners, in saving time, waste, and labour. A waggoner is also a term applied to the man who drives and directs waggons on the public roads. See Road.

Waggoners, *Royal*, or *Royal Waggon Train*, a corps of waggoners lately established, consisting of nine troops, each troop being 60 rank and file: but since its first establishment reduced.

WAGHKUNK, in *Geography*, a town of New York; 7 miles N.W. of Kingston.

WAGING, a town of the archbishopric of Salzburg; 17 miles N.W. of Salzburg.

WAGIOL, one of the smaller Papuan islands. See *New* Guinea.

WAGNA, a town of the duchy of Stiria, on the Salm; 17 miles S. of Gratz.

WAGNAGUR, a town of Hindoostan, in Guzerat, on the gulf of Cambay; 45 miles S.S.W. of Gogo.

WAGNER, Joachim, in *Biography*, a celebrated German organ-builder, who erected a large organ, in the garrison church at Berlin, in 1725, which is remarkable for compass, &c. having 50 keys in the manuals, and for its number of pipes, amounting to 3220; but still more so for the ornaments and machinery of the case, which are in the old Teutonic taste, and extremely curious.

At each wing is a kettle-drum, which is beat by an angel placed behind it, whose motion the organist regulates by a pedal; at the top of the pyramid, or middle column of pipes, there are two figures, representing Fame, spreading their wings when the drums are beat, and raising them as high as the top of the pyramid; each of these figures sounds a trumpet, and then takes its flight.

There are likewise two suns, which move to the sound of cymbals, and the wind obliges them to cross the clouds; during which time two eagles take their flight, as naturally as if they were alive.

The name of Wagner occurs twelve times in Gerber's continuation of Walther's Musical Dictionary. Seven of the number have distinguished themselves in music, some way or other

other by their talents. The other five have been organ-builders and makers of keyed instruments.

WAGOE, in *Geography*, one of the Faroer islands, west of Stromoe.

WAGOLY, a town of Hindoostan, in Dowlatabad; 15 miles N.E. of Poonah.

WAGON, a small island on the west side of the gulf of Bothnia. N. lat. 63° 12'. E. long. 13° 38'.

WAGRA, a town of Austria; 6 miles S.E. of Mauttern.

WAGRAIN, a town of the archbishopric of Salzburg, near the Gros Arl; 6 miles W. of Radstadt.

WAGRAM, a town of Austria; 2 miles N.E. of Voglabruck.

WAGRAM, or *Deutsch Wagram*, a town of Austria; 8 miles E. of Korn Neuburg.

WAGRIA, a district of Holstein, situated in the N.E. part, between the Baltic and the Trave.

WAGSTADT, or BILOWES, a town of Silesia, in the principality of Troppau; 24 miles W. of Teschen. N. lat. 49° 28'. E. long. 18°.

WAGTAIL, in *Ornithology*. See MOTACILLA.

WAGTER, NORD, in *Geography*, a small island in the gulf of Tonquin, near the coast of China. N. lat. 21° 13'. E. long. 109° 30'.

WAGTER, *Zuyd*, a small island in the Chinese sea, near the coast of Cochinchina. N. lat. 17° 18'. E. long. 106° 34'.

WAGUOIT BAY, a bay of the Atlantic, on the S. coast of Massachusetts. N. lat. 41° 30'. W. long. 70° 28'.

WAGUR, LITTLE, a district of Hindoostan, on the coast of the gulf of Cutch.

WAHABEES, WAHABIES, or *Wehhabis*, appellations that distinguish a formidable body of warlike sectaries, who sprung up in Arabia about a century ago, commenced their career as reformers of the Mahometan religion, and extended their migrations and conquests. According to Niebuhr, the founder of this sect was one Abd ul Wehhab, (Abdoulwehhbah, or Ubdool Wahab,) a native of Aijæne (Ujuna), a town in El Ared (Ool Urud), one of the two districts of Nedsjed in Arabia. This man, in his youth, is said to have studied at home (or at Medina) those sciences which are chiefly cultivated in Arabia; he afterwards spent some time at Bosra, and made several journeys to Bagdad, and through Persia. After his return to his native place, says Niebuhr, he began to propagate his opinions among his countrymen, and succeeded in converting several independent schiecks, whose subjects became followers of this new prophet. Those schiecks, who had before been in a state of hostility against one another, were reconciled by the mediation of Abd ul Wehhab, and agreed for the future to undertake no enterprise without the advice of their apostle. In process of time, Abd ul Wehhab reduced great part of El Ared; and being afterwards joined by schieck Mecrami, of Nedsjeran, who was also the head of a particular sect, he, or rather his son Mahomet, as he succeeded his father, was enabled to reduce the Sunnite schiecks, and as they acted in concert to subdue many of their neighbours. After the death of Abd ul Wehhab, his son retained the same authority, and prosecuted his father's views, of course he sustained the supreme ecclesiastical character in El Ared; and though the hereditary schiecks, which were more independent, still retain a nominal authority, yet Mahomet is in fact the sovereign of the whole, and exacts a tribute, under the name of "sikka," or aid, for the purpose of carrying on the war against the infidels. The Sunnites complain of his persecution; but, more probably, as Niebuhr says, this bigotted and superstitious sect hate and calumniate Mahomet for his innovations in religion. However this be, the inhabitants of Nedsjed, who demur against embracing the new religion, are retiring to other parts of the country. Zobaner, the ancient Basra, which had decayed to a condition little better than a hamlet, has been peopled by these refugees, and is now a large town.

As to the religious doctrine taught by Abd ul Wehhab, and adopted by his followers, Niebuhr states, that he believed God to be the only object of worship and invocation, and the creator and governor of this world. He forbade the invocation of saints, and so much as the mention of Mahomet, or any other prophet, in prayer, as practices favouring of idolatry. He considered Mahomet, Jesus Christ, Moses, and many others, respected by the Sunnites, under the character of prophets, as merely great men, whose history might be perused with improvement; at the same time denying that any book had ever been written by divine inspiration, or brought down from heaven by the angel Gabriel. He also forbade, as a crime against Providence, the making of vows, in the manner of the Sunnites, with a view of obtaining deliverance from danger. This new religion of Abd ul Wehhab, according to the account given of it by the schiecks, which, however, in some respects, differs from the statement of the Sunnites, may be regarded as a reformation of Mahometanism, proposing to reduce it to its original simplicity. Experience must decide whether a religion, so stripped of every thing that might serve to strike the senses, can long maintain its ground among a people so rude and ignorant as the Arabs. Abd ul Wehhab has also thought it necessary to impose some religious observances on his followers; and has interdicted the use of tobacco, opium, and coffee; and he has enacted a variety of civil regulations, with regard to the collection and distribution of the revenues.

Of these Wahabees other travellers have more recently detailed a variety of particulars, and we shall here avail ourselves of the information concerning them, communicated in the travels of Ali Bey, whose residence in Arabia, and pilgrimage to Mecca, afforded him an opportunity of acquainting himself with the history and religious usages of this tribe of sectaries. Of their founder we have already given a brief account. He commenced his career among the wandering Bedouin Arabs of the desert; and his first proselyte of any importance is said to have been Ibn Saaoud, a prince of certain tribes inhabiting the country to the east of Medina; and this prince took occasion, in the dissemination of his new doctrine, to attack and subjugate the neighbouring tribes. His successor, or, as some say, his coadjutor, was Abdelaaziz (Ubdool Uzeez), who prosecuting his system, carried in one hand his creed of reform, and his sword in the other; and having made himself master of the interior of Arabia, extended his military excursions as far as the vicinity of Bagdad; and in the year 1801, totally destroyed by fire the town of Imam Hossein, near this capital. The men and male children were all put to the sword; while a Wehhabite doctor, from the top of a tower, excited the massacre, by calling on the soldiers to kill "all the infidels who gave companions to God." In 1802, Mecca was taken after a trifling opposition by Saaoud, the son of Abdelaaziz, who razed to the ground all the mosques and chapels consecrated to the prophet or his family. This young warrior succeeded to the command of the Wehhabis the following year, on the assassination of his father; and, in 1804, made himself master of Medina, which had before resisted his arms. The conquest of Arabia was now nearly completed; and the

the sultan Saaoud became a formidable neighbour to the surrounding pachas of Bagdad, Damascus, and Egypt.

The constitution of this new sovereignty was singular in its kind. The town of Draäiya, among the deserts, 390 miles to the east of Medina, formed a sort of capital, or centre, of the governments of the Wehhabis. The various tribes of Arabs, scattered widely in tents and barracks over this vast extent of country, yielded obedience, both civil and military, to the sultan Saaoud. The tenth of their flocks and fruits was paid in tribute; an order from the sultan rapidly assembled a multitude of armed men, subsisting themselves at their own expence, totally unorganized as soldiers, but deriving force from their numbers—from their active spirit as sectaries—and from the large plunder they obtained in their military expeditions. Descending frequently from their desert recesses upon the coast of the Red sea, they arrested the caravans, and levied contributions upon the pilgrims journeying to Mecca and Medina. In the year 1807, when Ali Bey visited Mecca, the Wehhabis were in their greatest power. Their army, which he saw encamped in the vicinity of the sacred mount of Arafat, he estimates at 45,000 men,—a large proportion of the number mounted on camels and dromedaries, and with a train of a thousand camels attached to the different chiefs of the army. He describes with some spirit the appearance of another body of Wehhabis, whom he saw entering Mecca, to take possession of the city, and fulfil the duties of their own pilgrimage:—a multitude of copper-coloured men, who rushed impetuously into the place, their only covering a narrow girdle round their waist, to which was hung a *khanjear*, or large knife, each one carrying besides a firelock on his shoulder. Their devotions were of the most tumultuous kind; the lamps surrounding the sacred kaaba were broken by their guns; and the ropes and buckets of the well of Zemzem destroyed in their eagerness to reach the holy water. All the other pilgrims quitted their more decorous ceremonies, till the Wehhabis, having satisfied their zeal, and paid their alms to the well in gunpowder and coffee, betook themselves to the streets, where, in conformity with the law of Abd ul Wehhab, their heads were all closely shaved by the barbers of Mecca. The sultan Saaoud, whom Ali Bey saw at Arafat, was almost as naked as his subjects, distinguished chiefly by the green standard carried before him, with the characters, "*La illahá illa Allah,*"—"there is no other God but God," embroidered upon it.

With respect to their religious tenets, the Wehhabis may be described, generally, as the Socinians of the Mohammedan church. Abd ul Wehhab, while acknowledging fully the authority of the koran, professed obedience only to the literal text of this book; rejecting all the additions of the imams and doctors of law, and condemning various superstitions which had sullied the purity of the faith. He forbade all devotion to the person of the prophet, and pilgrimage to his tomb at Medina; regarding him simply as a man charged with a divine mission; which being completed, he became again an ordinary mortal. The story of Mahomet's ascent to Paradise on El Borak, the horse of the angel Gabriel, he wholly denied; together with a host of other miraculous events, with which history has celebrated the life of the prophet. The Wehhabis simply say "Mohammed," instead of "Our Lord Mohammed," according to the usage of other Mussulmen. They have equally rejected the indirect worship of certain saints, who had been gradually insinuated into the Mussulman calendar, destroying the chapels and tombs which had been consecrated to them. The grand doctrine of the sect, and what they regard as the basis of true Islamism, is the unity of God. This forms their cry when they go to war, and justifies to themselves the violences they commit upon the corrupters of the faith. The Mussulmen who deviate from this simple principle of belief they call Mouschrikinns, or schismatics; making a distinction between this term and that of Coffar, or idolaters.

As it was the general custom of Mussulmen to shave the head, with the exception of one tuft of hair, the law of the Wehhabis forbade the tuft, and enjoined the shaving of the whole head. Their founder also prohibited not only the use of tobacco, but that of silk and the precious metals. Their religious services are performed underneath the open sky, and not below the roofing of a mosque. Notwithstanding these changes, however, and the general spirit of their doctrine, they still retain certain superstitions, common to other Mussulmen. While forbidden to make some pilgrimages, others are permitted to them. They kiss the stone of the Kaaba, drink of the water of Zemzem, and throw stones against the pillar said to have been built by the devil at Mina.

The pacha of Egypt, with a view of employing his troops, amounting, at this time, to 15,000 men, and in order to gain favour with the Porte, and reputation among true Mussulmen, determined to liberate the holy city and shrine from the power of these heretics, and declared war against them. In the vigorous prosecution of it, his army was transported to the Arabian coasts; and the men and horses composing it, were supplied with provisions, carried up the Nile as far as Kenneh, thence transported across the desert on camels to Cosseir, and shipped for Jambo, or some other port on the eastern coast of the Red sea. Several armed vessels also were built at Alexandria, taken to pieces, and conveyed on the backs of camels to Suez, where they found a small fleet, which greatly aided his military operations on the Arabian coast. The pacha, it is said, received some arms from the English; but permission was refused, as we are told by Mr. Legh, to his request that his vessels might go round the Cape of Good Hope, to enter into the Red sea. The Wehhabis, on the other hand, are reported to have received assistance from the French government, conveyed through the Isle of France, and with the policy of creating a French interest in Arabia, which might be subservient to their pretensions in the East.

The campaign of the pacha of Egypt against the Wehhabis, in 1812, had been unsuccessful; and his army suffered very greatly in an engagement at Jedda, the port of Mecca on the adjoining coast. He redoubled, however, his exertions; organized new troops; and, early in the spring of 1813, brought the war to a triumphant termination. The Wehhabis were driven with loss from the coast; Mecca, Medina, and Jedda, were all retaken, and restored again to the authority of the Porte, and to the worship of the true believers. Mohammed Ali sent his youngest son, Ismael-Pacha, to Constantinople, to lay the keys of Mecca at the feet of the grand signior. The acquisition was rendered of the utmost importance, by the peculiar feeling of all Mussulmen towards the actual possessor of the holy city.

The progress of this sect, says Mr. Kinneir, appears to be now at a stand; few proselytes have been made for a number of years past; and the most paltry fortifications have been found sufficient to arrest the career of their conquests.

It does not appear certain, however, that this success is complete, or that its consequences will be permanent. The Wehhabis retired from the coast to their desert recesses in the interior of Arabia; where their losses may easily be repaired, if the spirit of the sect is maintained in its former vigour.

vigour. We have very recently heard, from what we believe to be good authority, that they are again becoming more active; and, though the military talents of the pacha of Egypt may restrain them at the present moment, we shall not be at all surprised, amidst the many revolutions of the East, if they should re-establish their power in Arabia; and concur, with other causes, to overthrow the tottering fabric of Turkish empire in this part of the world. Niebuhr's Travels, vol. ii. Waring's Tour to Sheeraz. Legh's Narrative of a Journey in Egypt, and the Country beyond the Cataracts. Ali Bey's Travels in Morocco, &c. 2 vols. 1816. Kinneir's Geog. Mem. of Persia. Edinb. Rev. No. liv.

WAHAL, a river which branches off from the Rhine at Schencken Schans, joins the Meuse first at the small island of Voorn, separates from that river, and washes the north side of the island of Bommelwaert, and joins the Meuse again at Worcum, when both rivers form one stream, sometimes called Merwe, and sometimes Meuse. See SAHALIS.

WAHE. See WA.

WAHLBO, a town of Sweden, in Gestricia; 4 miles S.W. of Geste.

WAHLBOMIA, in *Botany*, named by Thunberg, in honour of his countryman, Dr. John Gustavus Wahlbom, of whom he speaks as an ardent botanist, and celebrated physician.—Thunb. Act. Holm. for 1790. 215. t. 9. Willd. Sp. Pl. v. 2. 1244. Lamarck Illustr. t. 485. Poiret in Lam. Dict. v. 8. 782.—Class and order, *Polyandria Tetragynia*. Nat. Ord. *Senticosæ*, Linn. *Rosaceæ*, Juss. *Dilleniaceæ*, De Candolle.

Ess. Ch. Calyx of four leaves. Petals four. Fruit oblong. Styles permanent. *Willdenow*.

1. W. *indica*. Thunb. as above. Willd. n. 1.—The only species, found by Thunberg in the island of Java, near Batavia, flowering in January. A *shrub*, with round alternate *branches*, covered with hoary pubescence. *Leaves* alternate, stalked, elliptic-lanceolate, acute, serrated, three or four inches long; entire at the base; paler, but scarcely downy, beneath. *Flowers* somewhat umbellate, or cymose, near the ends of the branches, on downy stalks. *Calyx* externally downy. *Petals* yellowish, deciduous. *Stamens* brown, with yellow *anthers*. *Pericarps* four, beaked with the permanent *styles*.

We have mentioned already that Willdenow was inclined to sink this genus in TETRACERA; see the end of that article. Professor De Candolle has actually done so, in his Syst. Nat. v. 1. 403, where the plant in question stands under the following name and character.

T. *Wahlbomia*. "Leaves elliptical, pointed; serrated towards the end; downy beneath, like the footstalks; furnished with stipulas at the base? Panicle of four or five flowers. Segments of the calyx four, externally downy."—The author doubts whether this plant be even specifically distinct from his *T. Assa*, described in the same place, the *Assa indica* of Houttuyn, of which we have already spoken likewise at the conclusion of TETRACERA.

WAHLIS, in *Geography*, a town of Germany, in the county of Henneberg; 5 miles N.W. of Smalkalden.

WAHLSTADT, *i. e. The Field of Battle*, a town of Silesia, in the principality of Lignitz; near which, in the year 1241, a most bloody battle was fought between duke Henry II. and the Tartars, wherein the latter were victorious, and the duke slain. In memory of this event the place was built; and the narrative of this engagement is annually read to the people from the pulpit, in the Lutheran church; 5 miles S.E. of Lignitz.

WAHLWINKEL, a town of Saxony, in the principality of Gotha; 4 miles S.W. of Gotha.

WAHOE, one of the Sandwich islands, 37 leagues to the N. of Morotai, and about 30 from Owhyhee, nearly 40 miles long, from N.W. to S.E., and about half that extent in breadth. It is the most important island in the group, on account of its superior fertility, and because it possesses the only secure harbour in these islands. The capital of the island is Hanaroora, the residence of the king. Pearls and mother-of-pearl shells are found here in great abundance.

WAHR, a river of Germany, which rises near Frankenau, in the principality of Hesse, and runs into the Lahn near Kirchhayn.

WAHREN, or WAAREN, a town of the duchy of Mecklenburg, situated near the lake of Calpin; 22 miles S.E. of Gustrow. N. lat. 53° 30′. E. long. 12° 39′.

WAHREN *See*, a lake of the Ucker Mark of Brandenburg; 11 miles W.N.W. of Prenzlow.

WAHRENBRUCK, a town of Saxony; 2 miles N.N.W. of Liebenwerda.

WAHRIEN, a town of Mecklenburg, in the principality of Schwerin; 14 miles N.E. of Schwerin. N. lat. 53° 50′. E. long. 11° 38′.

WAHTO, a town of Sweden, in the government of Abo; 10 miles N. of Abo.

WAIBLINGEN, a town of Wurtemberg. This town was almost destroyed in the thirty years' war; 7 miles E.N.E. of Stuttgart. N. lat. 48° 50′. E. long. 9° 25′.

WAICHMAR. See WECHMAR.

WAIDENHOLZ, a town of Austria; 5 miles W.N.W. of Efferding.

WAIDERSFELDEN, a town of Austria; 12 miles E. of Freystatt.

WAIDGUNGE, a town of Hindoostan, in Oude; 30 miles E. of Allahabad.

WAIDHAUSEN, a town of Bavaria; 16 miles N.N.E. of Nabburg.

WAIDHOVEN, or *Bavarian Waidhoven*, a town of Austria, on the river Ips; 26 miles S.S.W. of Ips. N. lat. 47° 54′. E. long. 14° 43′.

WAIDHOVEN, or *Böhmisch Waidhoven*, a town of Austria, on the river Taya; 40 miles W. of Laab. N. lat. 48° 48′. E. long. 15°.

WAIDPOUR, a town of Bengal; 25 miles N.N.W. of Islamabad.

WAIF, or WAFE, a term primarily applied to stolen goods, which a thief, being either pursued, or overburdened, flies, and waives or throws away in his flight.

The king's officer, or the bailiff of the lord within whose jurisdiction such waifs or waif goods were left (having by grant, or prescription, the franchise of waif), may seize the goods to his lord's use; except the owner come with fresh suit after the felon, and sue an appeal of robbery within a year and a day, or give in evidence against him, and he be attainted. In which cases, the owner shall have his goods again.

Waived goods do also not belong to the king, till seized by somebody for his use; for if the party robbed can seize them first, though at the distance of twenty years, the king shall never have them. If the goods are hid by the thief, or left any where by him, so that he had them not about him when he fled, and therefore did not throw them away in his flight; these also are not *bona waiviata*, but the owner may have them again when he pleases.

pleafes. The goods of a foreign merchant, though ftolen and thrown away in flight, fhall never be waifs.

Waifs, things loft, and eftrays, are faid to be *pecus vagrans*, and are *nullius in bonis ubi non apparet dominus*. And therefore they belong to the lord of the franchife where they are found; who muft caufe them to be cried, and publifhed in the markets and churches near about: elfe the year and day do not run to the prejudice of him that loft them. See ESTRAY.

Though waif be properly fpoken of things ftolen, yet it may alfo be underftood of goods not ftolen. As, if a man be purfued with hue and cry, as a felon, and he flies, and leaves his own goods, thefe fhall be forfeited as goods ftolen; and they are properly called *fugitive goods*.

WAJIDA, in *Geography*, a town of Algiers; 25 miles S.W. of Tremecen.

WAIJOO, or WADJOO, one of the moft confiderable of the Papuan iflands, fituated at the N.W. extremity of Papua, or *New* GUINEA; which fee. This ifland is faid to contain 100,000 inhabitants. The land is high, with lofty mountains, and on the N. fide are two excellent harbours, Piapis and Offak. This ifland is called by the natives Ouarido; it is covered with very large trees, and abounds with mountains of a confiderable height, even at a fmall diftance from the fhore. Cottages of bamboo wood are feen, elevated on ftakes about 12 feet above the ground; and covered with leaves of the macaw tree. The natives are wholly naked, except the parts generally concealed, which are covered with a coarfe cloth. Their chiefs are dreffed in very large pantaloons, and waiftcoats of cloth, which they buy of the Chinefe, whofe language they fpeak, and like them they wear conical hats made of the leaves of a tree. They have thick and long curly hair; their fkin is not very dark, and fome of them let their whifkers grow. They fubfift upon hogs, tortoifes, fowls, Siam oranges, cocoa, papays, pompions, rice, fugar-canes, potatoes, lemons, allfpice, and ears of maize, which they boil when green. Labillardiere found in this ifland the beautiful promerops of New Guinea, of Buffon, the large cockatoo, quite black (pfittacus aterrimus), and a new fpecies of hydrocorax. The wild cock and ground-pheafant of the Indies are very common in the woods.

WAIL, a town of France, in the department of the ftraits of Calais; 5 miles S.E. of Hefdin.

WAIN, in *Agriculture*, a term fometimes applied to an ox or horfe-cart of a particular form, and which, in fome diftricts and places, is without any fide-rails, or ladders; but which in others has fhelvings added to it, the body being large and open. The Cornifh wain, the writer of the account of the agriculture of that county reprefents as a light ufeful carriage for conveying corn and hay: it confifts of a light open long body, borne upon two wheels; a railed arch put over the wheels prevents the load bearing upon them: it will carry from two hundred to two hundred and fifty fheaves of corn, they being fecured by ropes, as in the waggon. Mr. J. Dayman, of that diftrict, confiders it alfo as an admirable contrivance for clearing hay or corn-fields; and that when well conftructed, it is thought the beft invention for that purpofe yet contrived. That it is likewife cheap, as the fhafts and wheels of a common cart may be ufed with it, and, of courfe, the only additional expence is the body. Befides the railed wings, which prevent the load from choaking the wheels, it has a roller behind, with a hole in it, in which is faftened the rope which croffes the load, and which, after taking a turn round a crook put for the purpofe, returns again to the back of the carriage, and then forward to the other fide, where it is faftened; the whole is then drawn tight by the roller, which is wrought by two iron handles, in the manner of a fmith's vice. Thefe wains are made either with tongue-trees, or fhafts, as they may be defigned for oxen or horfes.

In the county of Gloucefter, too, they adapt their wains to harveft-work, it is faid, by fixing ladders and rathes on them. In the lower part of the vale of that diftrict, they are called, it is afferted, dung-pots; but in the foreft part, where drawn by oxen, wains.

They are a fort of carriage which is not very commonly met with at prefent in many farming diftricts. See CART.

WAIN, in *Aftronomy*. See CHARLES's *Wain*.

WAIN-*Houfe*, in *Rural Economy*, a term made ufe of in fome diftricts to fignify a waggon and cart houfe, or lodge.

WAINFLEET, or WAYNFLETE, in *Geography*, a market-town in the wapentake of Candlefhoe, in Lindfey divifion of the county of Lincoln, England, is fituated in a marfh, on a fmall creek through which the river Limb flows into Bofton deeps, at the diftance of 17 miles N.E. from Bofton, and 132 miles N. by E. from London. Dr. Stukeley affirms it to be the *Vainona* of Ravennas; whence he fuppofes the name to be evidently derived. He obferves that Salter's Road, which croffes the fen, was probably the Roman road between *Banovallum* and *Lindum*. Leland defcribes Wainfleet as "a praty market ftonding on a creke nere to the fe. To this toune long fmaul veffels. It hath beene a very godde toune, and yn it 2 paroch chirches. The fchole, that Wainflete bifshop of Winchestre made and endowid with xli. lande, is the moft notable thing. Shippeletes cam in hominum memoria up to the fchole. The haven now decayith." The neglect of the haven was in confequence of the waters of the fens being diverted more foutherly towards Bofton, by which that place became the port town: Wainfleet haven, however, affords fecurity to veffels driven on the coaft in tempeftuous weather. It is probable that the town, previous to the decay of the harbour, ftood higher up the creek, for the church of All Saints ftands at a place called High Wainfleet. This church is a refpectable edifice, but apparently not older than the time of bifhop Waynflete: it has a brick tower of modern date, and is rapidly decaying. In the fouth aifle is an alabafter monument, which was erected by the pious bifhop to the memory of his father. St. Mary's church, in Low Wainfleet, has nothing worthy of note. The fchool-houfe, founded in 1459, is yet ftanding, and has a handfome window, alfo two octagonal turrets. Four annual fairs are held, and a fmall weekly market on Saturdays. In the return to the population act of the year 1811, the number of houfes in Wainfleet is ftated to be 229, inhabited by 1165 perfons. This town is memorable as the birth-place of that celebrated prelate above-named, who was lord chancellor, and founder of Magdalen college, Oxford. He died Auguft 11, 1486.—Beauties of England and Wales, vol. ix., Lincolnfhire: by J. Britton, F.S.A. See Chandler's Life, &c. of Waynflete.

WAINSCOT, in *Building*, the timber-work ferving to line the walls of a room; being ufually made in panels, and painted, to ferve in lieu of hangings.

Even in halls, it is common to have wainfcot breaft-high, by reafon of the natural humidity of walls.

It was formerly the cuftom to wainfcot rooms up to the ceiling, and to terminate it by a cornice; but it is now commonly raifed only chair high, or from two to three feet; the reft of the wall is either covered with paper, which

which is often pasted on thin cloth, and fixed in frames, to prevent its being spoiled by the dampness of the wall, or else it is finished with stucco. Walls should be thoroughly dry before they are wainscotted, and the stuff of which the wainscot is made should be dry and well seasoned.

Some joiners put charcoal behind the panels of the wainscot, to prevent the sweat of stone and brick-walls from ungluing the joints of the panels. Others use wool for the same purpose. But neither the one nor the other is sufficient for some houses: the only sure way, is by priming over the backsides of the joints with white lead, or Spanish brown and linseed oil.

Wainscotting is measured by the square yard of nine feet; and in taking dimensions, they use a string, which they press into all the mouldings; it being a rule, that they are to be paid for all where the plane goes.

The cornice is measured and paid by the foot in length.

WAIORA, in *Geography*, a town of Africa, in Kaarta. N. lat. 14° 48′. W. long. 6° 10′.

WAISCHOWIZ, a town of Moravia, in the circle of Olmutz; 3 miles S.S.E. of Prosnitz.

WAIST, in *Ship-building*, a name given to that part of the topside of a ship, above the upper-deck, between the main and fore drifts: or it is that part which is contained between the quarter-deck and fore-castle, being usually a hollow space, with an ascent of several steps to either of those places. When the waist of a merchant-ship has only one or two steps of descent from the quarter-deck and fore-castle, she is said to be galley-built; but when it is considerably deeper, as with six or seven steps, she is called frigate-built. Falconer.

WAIT'S RIVER, in *Geography*, a river of Vermont, which runs into the Connecticut, N. lat. 43° 58′. W. long. 72° 5′.

WAITS, in *Music*, attendant musicians on great personages, mayors, and bodies corporate, generally furnished with superb dresses, or splendid cloaks. We have an account in Rymer's Fœdera, (tom. ix. "De Ministrielles propter Solatium Regis providendis,") and in the "Liber niger Domus Regis," of the establishment of the minstrels and waits, in the service of the court during the reign of Edward IV. The account of the allowances to the waits at this early period is curious.

"A wayte, that nightelye from Mychelmas to Shreve Thorsdaye pipethe the watche withen this courte fower tymes; in the somere nyghtes iij tymes, and makethe bon gayte at every chambere-doare and offyce, as well for feare of pyckeres and pillers. He eateth in the halle with mynstrielles, and takethe lyverey at nighte a loffe, a galone of alle, and for somere nightes ij candles pich, a bushel of coles; and for wintere nightes half a loafe of bread, a galone of ale, iiij candles piche, a bushel of coles; daylye whilste he is presente in courte for his wages in cheque roale allowed iiij d. ob. or else iij d. by the discresshon of the steuarde and tressorere, and that, aftere his cominge and diseruinge; also cloathinge with the houshold yeomen or mynstrielles lyke to the wages that he takethe; and he be syke he taketh twoe loves, ij messe of great meate, one gallon of ale. Also he partethe with the housholde of general gyfts, and hathe his beddinge carried by the comptrollers assygment; and under this yeoman to be a groome watere. Yf he can excuse the yeoman in his absence, then he takethe rewarde, clotheinge, meat, and all other things lyke to other grooms of houshold. Also this yeoman-waighte, at the makinge of knightes of the bathe, for his attendance upon them by nighte-tyme, in watchinge in the chappelle, hathe to his fee all the watchinge-clothing that the knight shall wear uppon him."

WAITSFIELD, in *Geography*, a town of America, in the state of Vermont, and county of Chittenden; containing 647 inhabitants.

WAITZEN, or VAITZ, a town of Hungary, situated on the Danube; the see of a bishop, founded in the year 1074. This town chiefly owes its prosperity to a large annual fair, and a good market for cattle. The number of inhabitants is about 8000; 72 miles E.S.E. of Presburg. N. lat. 47° 29′. E. long. 18° 38′.

WAITZENKIRCH, a town of Austria; 4 miles W.N.W. of Efferding.

WAIVE, in *Law*, a woman that is put out of the protection of the law.

She is called *waive*, as being forsaken of the law; and not *outlaw*, as a man is; by reason women cannot be of the decenna, and are not sworn in leets to the king, nor to the law, as men are; who are therefore within the law; whereas women are not, and so cannot be outlawed, since they never were within it.

In this sense we meet with *waviaria mulieris*, as of the same import with *utlegatio viri*.

WAIWODE, or WAYWODE, the appellation that distinguishes, in the Ottoman empire, the governor of a small province, or of a town, which not forming part of a pachalik, is sometimes the appendage of a sultana, of the grand visir, of the captain-pacha, or of any other great officer of the empire. He enjoys all the prerogatives of a pacha with two tails, but occupies an inferior rank. When he is required to march at the head of the armed force of his department, he joins his colours to those of the pacha with three tails. Both the one and the other are charged with carrying into execution, in their provinces, the sentences pronounced by the judges.

In the islands of the Archipelago, the Mussulmen or Greeks simply charged by the Porte with the gathering of the tax, and with the police of the place, are likewise distinguished by the name of waiwode.

The palatines, or governors of provinces in Poland, also bear the quality of *waywodes*, or *waiwodes*. See PALATINE.

The Poles likewise call the princes of Walachia and Moldavia *waywodes*; as esteeming them no other than on the foot of governors; pretending that Walachia and Moldavia are provinces of Poland, which have withdrawn themselves from the obedience of the republic. Every where else these are called *hospodars*.

Du Cange says, that the name *waywode* is used in Dalmatia, Croatia, and Hungary, for a *general of an army*; and Leunclavius, in his Pandects of Turkey, tells us, it usually signifies *captain* or *commander*.

WAKARI, in *Geography*, a small island on the east side of the gulf of Bothnia. N. lat. 60° 51′. E. long. 20° 47′.

WAKAYGAGH, or FORT, a river of America, which runs into lake Michigan, N. lat. 42° 58′. W. long. 87° 9′.

WAKE, WILLIAM, in *Biography*, a famous English prelate, was born at Blandford, in the county of Dorset, in 1657, and admitted at Christchurch college, at Oxford, in 1672, where he took his degrees in arts, and entered into holy orders. He afterwards accompanied his fellow-collegian, lord viscount Preston, to France, as his chaplain, and returning from thence to England after the accession of James II. was elected preacher to the society of Gray's Inn. In 1686 he published "An Exposition of the Doctrine of the Church of

of England," upon the plan of Boſſuet's "Expoſition of the Doctrine of the Catholic Church;" and he alſo publiſhed two defences of his treatiſe againſt the replies of Boſſuet and his coadjutor. In the popiſh controverſy, which at that time occupied the public attention, he wrote other pieces, and cloſed the diſpute with his "State of the Controverſy." In 1685, having abandoned his patron lord Preſton, who was attached to king James, he arrived in 1688, took a degree of D.D. at Oxford, became canon of Chriſtchurch, and in 1689, deputy-clerk of the cloſet to king William and queen Mary. In 1693 he publiſhed "An Engliſh Verſion of the genuine Epiſtles of the Apoſtolical Fathers, with a preliminary Diſcourſe concerning the right Uſe of the Fathers." In this work, of which an enlarged edition was publiſhed in 1710, he aſcribes an "authority to the fathers in matters of doctrine next to infallible." In 1694 he was preſented to the rectory of St. James's; and in 1697 he publiſhed his "Defence of the Power of Chriſtian Princes over their Eccleſiaſtical Synods, with particular reſpect to the Convocations of the Clergy and Church of England." By this and ſome ſubſequent publications of a ſimilar kind, ſuch as his "Vindication of the King's Supremacy againſt both popiſh and fanatical Oppoſers of it," and "The State of the Church and Clergy of England," 1703, fol. he recommended himſelf to the crown; ſo that in 1702 he obtained the deanery of Exeter, and in 1705 the biſhopric of Lincoln. During the prevalence of whig principles, which were then faſhionable, the biſhop recommended a comprehenſion with the Diſſenters, and zealouſly concurred in the cenſure and puniſhment of Dr. Sacheverel. He maintained his moderation in the reign of queen Anne, and oppoſed the intolerant meaſure of the ſchiſm-bill. Soon after the acceſſion of George I. he was advanced, January 1715-16, to the ſee of Canterbury. This elevation gave a new turn to his ſentiments and temper, ſo that in 1718 he oppoſed the repeal of the ſchiſm and conformity bill, and alſo of the teſt and corporation acts, alleging that "the Diſſenters were never to be gained by indulgence;" and expreſſing much diſpleaſure againſt Hoadly's celebrated ſermon, "Chriſt's Kingdom not of this World;" and concurring in a bill for impoſing a new teſt againſt the opinions of the Arians. Theſe meaſures, which did no credit to the conſiſtency of his character, were juſtified under a pretence of zeal for the church. By his earneſt endeavours to effect an union between the Engliſh and Gallican churches, on the condition that each ſhould retain the greateſt part of its peculiar doctrines, he incurred a conſiderable degree of cenſure, particularly on the part of the author of the "Confeſſional;" but his character and intentions were vindicated by Dr. Maclaine, in an appendix to his Tranſlation of Moſheim's Eccleſiaſtical Hiſtory, to which, as well as to the Biographia Britannica, we refer for a ſtatement of this buſineſs. After all, his diſcretion and ſagacity as to the object and conduct of this tranſaction did not eſcape juſt animadverſion. Such, however, was his conciliatory diſpoſition, and his diſpoſition to promote concord and union, that he acknowledged the foreign Proteſtant churches to be true members of the Chriſtian community, and recommended forbearance and toleration with regard to theological doctrines. It is, however, a matter of regret, that his treatment of ſeparatiſts at home did not manifeſt, to the degree that might have been wiſhed, a ſimilar ſpirit of toleration. His conduct towards father Courayer, an eminently liberal Catholic, redounded greatly to his honour. In the latter period of his life, his increaſing infirmities rendered it neceſſary for him to transfer the exerciſe of his eccleſiaſtical duties to Dr. Gibſon, biſhop of London; and at length he cloſed his life and labours, January 1736-7, in his 80th year, leaving ſix daughters, who were all married, and bequeathing his library, MSS., and coins, to the college in which he was educated. Four editions of a treatiſe, intitled "A Preparation for Death," &c. and 3 volumes of his Sermons, Charges, &c. were publiſhed.—Biog. Brit. Moſh. E. H. Appendix, N° iv. vol. vi. ed. 8vo. 1811.

Wake, in *Geography*, a county of North Carolina, containing 17,086 inhabitants, including 5878 ſlaves.

Wake *of a Ship* denotes the print or track impreſſed by the courſe of a ſhip on the ſurface of the water. It is formed by the reunion of the body of water, which was ſeparated by the ſhip's bottom whilſt moving through it, and may be ſeen to a conſiderable diſtance behind the ſtern, as ſmoother than the reſt of the ſea. Hence it is uſually obſerved by the compaſs, to diſcover the angle of lee-way.

By this, a gueſs alſo may be made of the ſpeed ſhe makes.

When, in a ſhip's ſtaying, ſhe is ſo quick, that ſhe does not fall to leeward, upon a tack, but that, when tacked, her wake is to the leeward, they ſay, *ſhe ſtays to the weather of her wake;* which is a ſign ſhe feels her helm well, and is nimble of ſteerage.

Alſo, when one ſhip, purſuing another, is got as far into the wind as ſhe, and ſails directly after her, on the ſame tack, or on a line ſuppoſed to be formed on the continuation of her keel, they ſay, *ſhe is got into her wake*.

Two diſtinct objects obſerved at ſea are ſaid to be in the wake of each other, when the view of the fartheſt is intercepted by the neareſt; ſo that the obſerver's eye, and the two objects, are all placed upon the ſame right line.

Wake-*Robin*, or Cuckow-*Pint*, in *Botany*. See Arum. The root of arum, dried and powdered, is uſed by the French for waſhing their ſkin, and is ſold at a high price under the name of Cypreſs powder; it is both a good and an innocent coſmetic.

Theſe roots are ſaid to poſſeſs a ſaponaceous quality, and have been uſed in waſhing linen inſtead of ſoap. In their dry ſtate, when they have been deprived of their acrimony, they have been made into bread, and alſo prepared as ſtarch.

The leaves and flowers of *ariſarum equalis*, broad-leaved friar's cowl, are deterſive and vulnerary; and applied either in the form of ointment or decoction to malignant ulcers. Its root taken in powder is eſteemed againſt the plague, the doſe being from a ſcruple to a drachm. Of the root alſo are made collyria, which are uſed in curing fiſtulas of the eyes. Vide Lemery, des Drog. in voc.

WAKEFIELD, Gilbert, in *Biography*, an eminent claſſical ſcholar, was the ſon of the Rev. George Wakefield, rector of St. Nicholas, Nottingham, and born in that town in the year 1756. After a previous grammatical education, he was admitted, in 1772, into Jeſus college, in the univerſity of Cambridge. Here he purſued his ſtudies with an aſſiduity which eſtabliſhed his reputation; and having taken his degree of B.A. in 1776, he was ſoon afterwards elected a fellow of his college. At this early period, he publiſhed a ſmall collection of Latin poems, and a few critical notes on Homer. Having directed his particular attention to theological inquiries, he began betimes to entertain doubts concerning the articles of the church, and though he took deacon's orders in 1778, he reproached himſelf for complying with the previous forms. He commenced his miniſterial labours as a curate at Stockport, and thence he removed to Liverpool, diſcharging the duties of his office with a ſuitable ſenſe of their importance. Diſſatisfied, however, with the doctrines and liturgy of the church, he determined to ſurrender his connection with it; and having married in 1779, he accepted an

an invitation to be classical tutor at the dissenting academy of Warrington, without avowing himself as a Dissenter.

Having in 1781 published his plan of a new version of the New Testament, with a specimen of the proposed work, he presented to the public, in 1782, "A New Translation of the Gospel of St. Matthew, with Notes critical, philological, and explanatory," 4to., which was well received. Upon the dissolution of the academy at Warrington, he removed to Bramcote in Nottinghamshire, where he received private pupils; and here he published in 1784 the first volume of an "Enquiry into the Opinions of the Christian Writers of the first Three Centuries concerning the Person of Jesus Christ," 8vo., which was received in a manner that discouraged him from pursuing his plan. Being disabled by the attack of a disorder in one arm to undertake any literary performance that required any considerable exertion, he intermitted his constant occupations; till at length in 1789 he commenced his "Silva Critica, sive in Auctores sacros prophanosque Commentarius Philologicus;" of which three parts appeared successively to the year 1795, the three first being issued from the Cambridge press. Mr. Wakefield, in 1790, removed from Nottingham to Hackney, in order to assume the office of classical tutor in the dissenting college of that place, where his services were highly acceptable, till the publication of his "Enquiry into the Expediency and Propriety of public or social Worship," in 1791; which being intended to justify the disuse of the public exercises of devotion, occasioned a termination of his connection with that institution. From this time he employed himself in attention to the instruction of his own family, and to several literary works; the principal of which were his "Translation of the New Testament, with Notes critical and explanatory," 3 vols. 8vo. 1792, of which a second edition appeared in 1795, 2 vols. 8vo.; and "Memoirs of his own Life," published in the same year. His other productions were "Evidences of Christianity," and "Replies to the Two Parts of Thomas Paine's Age of Reason;" a volume of Pope's Works, a volume of "Notes on Pope," and an edition of his version of the Iliad and Odyssey of Homer. His "Silva Critica" was also enlarged to the 5th volume; and he presented to the public editions of select "Greek Tragedies," of "Homer," "Bion and Moschus," "Virgil," and "Lucretius," in 3 vols. 4to., a work highly esteemed.

Avowing himself an enemy to war in general, and to the war against France in particular, he published a pamphlet in 1798, entitled "A Reply to some Parts of the Bishop of Landaff's Address to the People of Great Britain," which subjected him to a prosecution: this terminated in a trial and conviction in February 1799. His sentence was imprisonment for two years in the county gaol of Dorchester. Many concurring circumstances contributed to render this punishment singularly grievous to him; but it was in a considerable degree alleviated by the sympathy and respect of his friends, and by a liberal subscription towards the support of himself and his family. His course of study was thus unfortunately interrupted, so that he could only prepare for the press "Select Essays of Dio Chrysostom, translated into English from the Greek, with Notes," 1800, 8vo., and "Noctes Carcerariæ, sive de Legibus Metricis Poetarum Græcorum, qui Versibus Hexametris scripserunt, Disputatio," 1801, 12mo.; and make collections for his proposed Lexicon, Greek and English. In May 1801 he was liberated from his confinement; but on September the 9th of the same year, a typhus fever terminated his life, in his 46th year, to the grief of his family and the regret of numerous friends, by whom he was highly esteemed.

The assiduity of his literary application, and the singular temperance of his habits, though they occasioned a seclusion from much of that social intercourse which was interesting to his family, and a degree of reserve in his own temper, enabled him, however, to acquire great reputation as a philological writer and critic during comparatively a short life. Under this character, he resembled Bentley and Markland, being, like them, in his conjectural criticism, "always learned, sometimes bold, and frequently happy." Possessing a very retentive memory, his extensive reading furnished him with an ample store of passages for illustration or parallel, of which he could avail himself as occasions occurred. With regard to his moral disposition and character, they were marked, as a biographer who knew him well has delineated them, "by an openness, a simplicity, a good faith, an affectionate ardour, a noble elevation of mind, which made way to the hearts of all who nearly approached him, and rendered him the object of their warmest attachment." The second edition of his "Memoirs," published after his death, contains a catalogue of all his works, several of which have been omitted in this concise account of his life and labours. A collection of letters between him and Mr. Fox, by whom he was highly esteemed, chiefly on subjects of Greek literature, has also been published. Memoirs. Gen. Biog.

Wakefield, in *Geography*, a large market-town in the lower division of the hundred of Agbrigg, in the West Riding of the county of York, is situated on the side of an eminence, gently sloping southward to the river Calder, at the distance of 9 miles S. from Leeds, 32 miles S.W. by S. from York, and 182 miles N.N.W. from London. It consists of nine streets, of which three are very large and commodious; and many of the houses are spacious and lofty. The market-place is small, but has been recently rendered much more convenient by the removal of the corn-market into West-gate, an adjacent street of great extent. Here is a neat building called the Market-cross, formed of an open colonnade of the Doric order, supporting a dome, with an ascent of a circular flight of stairs leading to a large room, which receives its light from a lantern at the top: in this chamber most of the business of the town is transacted. The market is held on Fridays, which is well attended, particularly for the sale of wool, which is sent from various parts of England to the factors in Wakefield, who dispose of it among the manufacturers in the adjacent districts. Here are two annual fairs, each of which continues two days, for horses, horned cattle, pedlary ware, &c. A fair is also held every fortnight, on the alternate Wednesdays, for cattle and sheep, which affords a constant supply of butchers' meat to almost the whole of this riding, and the borders of Lancashire. The parish church of Wakefield is a spacious and lofty edifice; and the spire is one of the highest in the county. By the Domesday record there appears to have been a church here at the time of the Conquest, but no part of the present structure can be referred to a more early period than the reign of Henry III., and it has undergone many modern repairs and improvements. In 1724 the south side was entirely rebuilt; and the greatest part of the north side, together with the east end, towards the close of that century: a vestry-room has likewise been erected. About half a mile to the north is the new church, built about the end of the eighteenth century. The ground on which it stands was bequeathed for that purpose by Mrs. Newstead, a widow lady, together with 1000*l.* towards the support of a minister. But the will being litigated, the matter lay dormant for some years, till the whole property of the testatrix was purchased by Messrs. Maude and Lee, who, in concurrence with some other opulent persons, procured an act

act of parliament for building the church and enlarging the town. The church was accordingly erected, and a great number of houses, disposed in streets and squares, forming a district, which, as well as the church, is denominated St. John's. In the town are three meeting-houses for Dissenters of the Presbyterian, Calvinistic, and Methodist denominations. Here is also a free grammar-school, founded and endowed by queen Elizabeth, but much improved by private benefactions: the school-house is a spacious structure, erected by the Savilles, ancestors of the earl of Mexborough. A charity-school is also established here for the instruction and clothing of 106 boys and girls. Charitable donations to this town are very considerable, amounting to 1000*l.* *per annum*, under the direction of fourteen trustees, called governors: this money is applied to the maintenance of several exhibitions in both universities, to the apprenticing of poor boys to various trades, to the support of aged and infirm persons, and to other benevolent purposes at the discretion of the governors. At the end of West-gate, the principal street in the town, is the house of correction for the whole riding: this prison is a spacious stone building, surrounded by an outer wall, and contains above 150 cells. A commodious sessions-house has been recently erected; and great improvements are consequently taking place in the adjacent streets. The quarter sessions for the West Riding are held here in January; and private sessions every fortnight by the justices in the vicinity. At the south-east entrance into Wakefield is a stone bridge, of nine large arches, over the Calder; it exhibits a fine specimen of the masonry of Edward III.'s reign, in which period it was built. In the centre of this bridge, projecting from the eastern side, and partly resting on the starlings, is an ancient chapel, formed in the richest style of ecclesiastical architecture, about ten yards in length and eight in breadth. The east window, overhanging the river, is adorned with tracery, and the parapets are perforated; the windows on the north and south are equally rich; but the west front facing the passage over the bridge exceeds all the rest in profusion of ornament, being divided by buttresses into compartments forming recesses with lofty pediments and pointed arches, with spandrils richly flowered, and above is an entablature supporting five basso relievos, the whole being crowned with battlements. This chapel was built by Edward IV. in memory of his father, Richard duke of York, and those of his party who fell in the battle of Wakefield. This superb relic of antiquity has of late years been used as a warehouse, and its embellishments have received considerable damage.

Wakefield was noted in Camden's time for its extent, buildings, cloth trade, and markets, as well as for the chapel above described. Since that period, the improvements in the woollen-cloth manufacture, with the introduction of those of tammies, camblets, and fancy articles, have greatly increased its wealth and population. A handsome hall has recently been erected by subscription for the sale of the stuffs: it is two stories high, extending in length about seventy yards, and ten in breadth; through the middle, in each story, is a row of repositories, in all about two hundred, facing each way, and properly labelled, so that the stand of any manufacturer may be readily found. Wakefield being situated on the edge of the manufacturing district, of which the Calder forms the eastern boundary, scarcely a single manufacturer is seen to the eastward. The navigation of the Calder has greatly promoted the trade of this town, to which the river was rendered navigable in 1698. Great quantities of coals are carried hence by water for the supply of York, Hull, and the adjacent parts. In the population return of the year 1811, Wakefield is stated to contain 1959 houses, and 8593 inhabitants. The manor of Wakefield is very extensive, including that of Halifax, and stretching from Normanton westward to the confines of Lancashire: it is more than thirty miles in length, from east to west, and comprises 118 towns, villages, and hamlets. By the Domesday-book it appears to have been part of the royal demesnes of Edward the Confessor, and at the time of the survey it belonged to the crown. During the four subsequent centuries, it was granted to various branches of the royal families, and other distinguished nobles. In 1461 it reverted to the crown in the person of Edward IV., and remained in the possession of the kings of England till 1554, when it was united to the duchy of Lancaster. In the reign of Charles I. it was granted to Henry earl of Holland, who was beheaded in 1649, by the sentence of the high court of justice. Being afterwards granted to Robert earl of Warwick, the manor went, by the marriage of his daughter, to sir Gervase Clifton, who, in 1663, sold it to sir Christopher Clapham, from whose heirs it was purchased in 1700 by the duke of Leeds, in whose family it still continues.

About a mile and a half to the east of Wakefield is the village of Heath, which, for situation, variety of seats, and beautiful lawns, is justly esteemed the finest in the kingdom. Here is an elegant seat of W. Farquier, esq.; and at this place was also the seat of the late right honourable John Smyth, member for Pontefract, and a lord of the admiralty.

Two miles south of Wakefield is Sandal, a small village chiefly remarkable for its ancient castle, built in the reign of Edward II. by John earl of Warren, and afterwards the property of Richard Plantagenet, duke of York, who, aspiring to the crown, was slain before its walls, December 31, 1460, in the memorable "battle of Wakefield," so called from Wakefield Green being the scene of action. The place where he fell was inclosed with a wall, and on it was erected a cross of stone, which was destroyed in the civil war of Charles I., in whose behalf the castle was garrisoned; but it surrendered after a siege of three weeks in October 1645, and in the following year the castle was demolished by order of parliament. At present scarcely a vestige is left of its former strength and magnificence; the principal remaining part is occupied as a farm-house.—Beauties of England and Wales, vol. xvi. Yorkshire. By J. Bigland.

WAKEFIELD, a town of America, in the state of New Hampshire, and county of Strafford; containing 1166 inhabitants; 30 miles E. of Concord.

WAKEFIELD, *Upper*, a township of Pennsylvania, in the county of Bucks, containing 1271 inhabitants.

WAKEFIELD, *Lower*, a township of Pennsylvania, in the county of Bucks, containing 1089 inhabitants.

WAKEFULNESS, or WATCHING, *insomnia*. See WATCHING.

WAKES, formed from the Saxon *wacce*, *vigilia*, *excubiæ*, *watch*, *vigils*, or *country-wakes*, are certain ancient anniversary feasts, in several parishes; wherein the people were to be awake at the several vigils, or hours to go to prayer. See VIGIL.

They are usually observed, in the country, on the Sunday next before the saint's day to whom the parish-church is dedicated.

The learned Mr. Whitaker, in his History of Manchester, hath given a particular account of the origin of wakes and fairs. He observes, that every church at its consecration received the name of some particular saint: this custom was practised among the Roman Britons, and continued among the Saxons; and in the council of Cealchythe, in 816, the name of the denominating saint was expresly required to be inscribed on

on the altars, and also on the walls of the church, or a tablet within it. The feast of this saint became of course the festival of the church. Thus Christian festivals, in the room of the primitive αγαπας, or love-feasts, were substituted for the idolatrous anniversaries of heathenism: accordingly at the first introduction of Christianity among the Jutes of Kent, pope Gregory the Great advised what had been previously done among the Britons, *viz.* Christian festivals to be instituted in the room of the idolatrous, and the suffering-day of the martyr whose relics were reposited in the church, or the day on which the building was actually dedicated, to be the established feast of the parish. Both were appointed and observed; and they were clearly distinguished at first among the Saxons, as appears from the laws of the Confessor, where the *dies dedicationis*, or *dedicatio*, is repeatedly discriminated from the *propria festivitas sancti*, or *celebratio sancti*. They remained equally distinct till the Reformation; the dedication-day in 1536 being ordered for the future to be kept on the first Sunday in October, and the festival of the patron saint to be celebrated no longer. The latter was, by way of pre-eminence, denominated the church's holiday, or its peculiar festival; and while this remains in many parishes at present, the other is so utterly annihilated in all, that bishop Kennet, says Mr. Whitaker, knew nothing of its distinct existence, and has attributed to the day of dedication what is true only concerning the saint's day. Thus instituted at first, the day of the tutelar saint was observed, most probably by the Britons, and certainly by the Saxons, with great devotion. And the evening before every saint's day, in the Saxon-Jewish method of reckoning the hours, being an actual part of the day, and therefore like that appropriated to the duties of public religion, as they reckoned Sunday from the first to commence at the sun-set of Saturday; the evening preceding the church's holiday would be observed with all the devotion of the festival. The people actually repaired to the church, and joined in the services of it; and they thus spent the evening of their greater festivities in the monasteries of the North, as early as the conclusion of the seventh century.

These services were naturally denominated from their late hours *waccan* or wakes, and vigils or eves. That of the anniversary at Rippon, as early as the commencement of the eighth century, is expresly denominated the vigil. But that of the church's holiday was named *cyric waccan*, or church-wake, the church-vigil, or church-eve. And it was this commencement of both with a wake, which has now caused the days to be generally preceded with vigils, and the church-holiday particularly to be denominated the church-wake. So religiously were the eve and festival of the patron saint observed for many ages by the Saxons, even as late as the reign of Edgar, the former being spent in the church, and employed in prayer. And the wakes, and all the other holidays in the year, were put upon the same footing with the octaves of Christmas, Easter, and of Pentecost. When Gregory recommended the festival of the patron saint, he advised the people to erect booths of branches about the church on the day of the festival, and to feast and be merry in them with innocence. Accordingly, in every parish, on the returning anniversary of the saint, little pavilions were constructed of boughs, and the people indulged in them to hospitality and mirth. The feasting of the saint's day, however, was soon abused; and even in the body of the church, when the people were assembled for devotion, they began to mind diversions, and to introduce drinking. The growing intemperance gradually stained the service of the vigil, till the festivity of it was converted, as it now is, into the rigour of a fast. At length they too justly scandalized the Puritans of the seventeenth century, and numbers of the wakes were disused entirely, especially in the east and some western parts of England; though the order for abolishing them was reversed by the influence of Laud: but they are commonly observed in the north, and in the midland counties.

This custom of celebrity in the neighbourhood of the church, on the days of particular saints, was introduced into England from the continent, and must have been familiar equally to the Britons and Saxons; being observed among the churches of Asia in the sixth century, and by those of the west of Europe in the seventh. And equally in Asia and Europe, on the continent, and in the islands, these celebrities were the causes of those commercial marts which we denominate *fairs*; which see. The people resorted in crouds to the festival, and a considerable provision would be wanted for their entertainment. The prospect of interest invited the little traders of the country to come and offer their wares; and thus, among the many pavilions for hospitality in the neighbourhood of the church, various booths were erected for the sale of different commodities. In larger towns, surrounded with populous districts, the resort of the people to the wakes would be great, and the attendance of traders numerous; and this resort and attendance constitute a fair. Basil expresly mentions the numerous appearance of traders at these festivals in Asia, and Gregory notes the same customs to be common in Europe. And as the festival was observed on a feria or holiday, it naturally assumed to itself, and as naturally communicated to the mart, the appellation of feria or fair. Indeed, several of our most ancient fairs appear to have been usually held, and have been continued to our time, on the original church-holidays of the places: besides, it is observable, that fairs were generally kept in church-yards, and even in the churches, and also on Sundays, till the indecency and scandal were so great as to need reformation. See Burn's Eccl. Law, art. *Churches.*

WAKI, in *Geography*, a town of Japan, in the island of Niphon; 60 miles W. of Meaco.

WAKKAMAW, a lake of North Carolina, which communicates, by means of a river of the same name, with Winyah Harbour, after a course of about seventy or eighty miles.

WAKOW. See WIGSTADSEL.

WAKUA, a small island on the E. side of the gulf of Bothnia. N. lat. 60° 45′. E. long. 21° 15′.

WALA, a town of Sweden, in the province of Westmanland; 26 miles N. of Stromsholm.

WALACHIA, a province of European Turkey, bounded on the north by Moldavia and Transylvania, on the east by Bessarabia, on the south by Bulgaria, and on the west by the bannat of Temesvar and Transylvania; about 280 miles from E. to W., and 150 from N. to S., where widest; but in some places hardly 60: by the inhabitants it is called "Romulia," and by the Hungarians "Havasalfoldgye." The air is temperate, the soil very fruitful, particularly in grain, wine, and melons; graziery here, too, is very considerable; but its principal reputation is for excellent horses. The country is watered by a considerable number of large and small rivers, most of which run from N. to S., discharging themselves immediately into the Danube, or in conjunction with other rivers. The principal of these are the Alaut, which rises in the mountains of Transylvania, and divides Walachia into two unequal parts, namely, the West and East; the Jalonitza, which has also its source in the borders of Transylvania; and the Sireth, or Sirech, the boundary on the side of Moldavia. Their bridges are all built with wood, which is plentiful in the country. The Walachians, considered as inhabitants

inhabitants of the country, are descended from the old Roman colony settled here by the emperor Trajan. They profess the Eastern Greek religion; and as in writing they use the same letters with the Russians, so they agree with them in all their religious ceremonies. According to the account given of them by Jackson (Journey from India), they seem to be very superstitious. They erect crucifixes, some of stone and others of wood, near the roads; all of them are painted; some having Jesus Christ, some the Virgin Mary, others the twelve apostles, some the ten commandments, prayers, &c. depicted upon them. These crucifixes are very numerous, and most of the country-people pay respect to them as they pass. The commonalty are most wretchedly ignorant; and even the highest attainments which the ecclesiastics themselves aim at, seldom go beyond reading and singing well. Bucharest is a kind of university to them, whither they go to learn a polite deportment, the elegancies of the Walachian language, and ceremonies of the church. The persons of rank among the Walachians are so fond of the Italian language, that they apply themselves to it more than their mother-tongue, and generally send their sons to study at the university of Padua. Great numbers of Mahometans live also intermixed with the Walachians; some Jews, and also Germans. The Romans, after their decisive victory over Decebalus, king of Dacia, made themselves masters of his kingdom. Trajan sent hither several Roman colonies, who not only cultivated the land, but built them towns, which they embellished with fine edifices. His successor, however, in the empire, transplanted the greatest part of them into Mœsia and Thracia, where, mingling with the Bulgarians, Thracians, Servians, and Ligurians, they came to speak a new language or jargon. These kingdoms, which lie on the Danube, afterwards constituted part of the dominions of the emperors of the East. In process of time, the Walachians moved farther north, to the borders of Podolia and Russia, where they applied themselves to agriculture and the breeding of cattle. The conversion of the Bulgarians and their neighbours to Christianity was followed, in the ninth century, by that of the Walachians, who embraced the Grecian doctrines. Towards the beginning of the twelfth century, a numerous colony of Walachians, under the conduct of one Nigers, or Negrovot, for the sake of pasturage, religion, and other motives, passed on towards the south, and settled in the modern Walachia, founding the towns of Tergovista, Bucharest, and Pitesti. They choose their own princes, whom they style waywodes, or despots. The kings of Hungary, becoming powerful, made several attempts on the Walachians; and, in the fourteenth century, obliged them to pay tribute. But in the year 1391, and 1394, they were greatly harassed by the Turks, who, in the year 1415, also laid the whole country waste with fire and sword, compelling Dan, the waywode, to pay them an annual tribute. It was in the year 1608, before the Walachians could rid themselves of this burthen, when they put themselves under the protection of the emperor of Germany. But the treaty of Carlowitz resigned them up again to the Turkish dominion. In the beginning of the seventeenth century, they suffered various calamities by the plague, war, and the many revolutions among their princes. At the treaty of Passarowitz, in 1718, the western part of Walachia, as far as the river Alaut, was ceded to the emperor, but lost again in the year 1739. Walachia is governed by a waywode, or prince, styled also the hospodar, who is a vassal of the Ottoman Porte, and whose yearly tribute generally amounts to 58 or 60,000 ducats.

WALADIA, El, a town of Morocco, situated in an extensive plain, 35 miles S. of Mazagan. Annexed to it is a spacious harbour, capable of containing 500 sail of the line, but the entrance is obstructed by a rock or two, which might, it is said, be easily blown up; otherwise this would be one of the finest harbours for shipping in the world. The coast of El Waladia is lined with rocks, at the bottom of which, and between them and the ocean, is a table land, almost even with the surface of the water, abounding with springs, where every necessary and luxury of life abound. The view of the land from the plains above the rocks is extremely beautiful and picturesque. The town of El Waladia is small, and encompassed by a square wall, and contains but few inhabitants. Its name seems to indicate that it was built by Muley El Walad, towards the middle of the seventeenth century. Jackson's Morocco.

WALÆUS, John, in *Biography*, a celebrated anatomist, was born in 1604, near Middleburg, in Zealand, and studied physic at Leyden, where he graduated in 1631. In 1632 he was nominated a medical professor extraordinary, and in 1648 he obtained a chair in ordinary. His practice was extensive, and his academical duties numerous; and yet he employed himself much in the dissection of living animals, and was enabled to illustrate the functions of digestion, the distribution of the chyle, and the action of the heart. He first taught publicly the Harveian doctrine of the circulation of the blood; though from jealousy of the honour of the inventor, he was disposed to announce vestiges of the fact which he discovered in the writings of the ancients. He died at Leyden in 1649. His Anatomical Observations, which are reckoned excellent, are contained in "Epistolæ duæ de Motu Chyli et Sanguinis ad T. Bartholinum," Lugd. B. 1641. Haller. Eloy.

WALAFRIDUS, surnamed *Strabo*, or *Strabus*, from a squint in his eyes, was born in Swabia in 807, and educated in the monastery of Reichenau, whence he proceeded to Fulda, to receive further instruction from Rabanus. After his return to his monastery he became director of its school, and very much contributed to its reputation. Being sent on an embassy by king Louis to his brother Charles the Bald, he died in the year 849. Of his works, which are numerous, those most worthy of notice are his "Glossa ordinaria," or short observations on the whole text of the Bible, chiefly derived from the exposition of Rabanus, and annexed to many editions of the Vulgate, printed in the fifteenth and sixteenth centuries; "De Exordiis et Incrementis Rerum Ecclesiasticarum;" "De Vita beati Galli Confessoris, lib. ii.;" "Vita Otmari Abbatis S. Galli;" "Poemata," among which are, "Hortulus," or a description of the garden which he cultivated, with its herbs and flowers, and their medical use. Gen. Biog.

WALAJABAD, in *Geography*, a town of Hindoostan, in the Carnatic; 10 miles E. of Conjeveram.

WALAKA, a low, insalubrious, but fertile, province of Abyssinia, situated between the two rivers Geshen and Samba, having to the S. of it Upper Skoa. This province is surrendered by the reigning prince to the Galla, who, at his desire, have surrounded Skoa on every side. But as it is full of the bravest and best horsemen, and best accoutered of any in Abyssinia, they can, whenever they please, dispossess the Galla.

WALAN, in *Botany*, Rumph. Amboin. v. 3. 214. t. 139. Poiret in Lamarck Dict. v. 8. 783, the Amboyna name of a tree, which Rumphius also calls *Ichthyoctonos montana*, from its use in killing fish, but of whose botanical characters little or nothing is known.

This tree has a straight and lofty *trunk*, whose *bark* is thick, dry, brittle, reddish, of a bright fiery red towards the root; the wood white, and of little value, except the heart

heart of old trees, which is brown and compact. The *roots* are red and copious. *Leaves* scattered, stalked, obovate, pointed, entire, eight or ten inches long, three or four wide, smooth, rather fleshy, having a mid-rib, with several slight transverse veins. Of the *flowers* no description is given, but they are represented on simple lateral *stalks*, solitary or in pairs, and seem formed of four round *petals*. The *fruit* is said to be as large as an orange, and of the same colour, drooping, making a beautiful appearance, intermixed with the green leaves, in October. Its shape, however, is more ovate, with a point, and the base is embraced by a cup-shaped, five-angled, permanent *calyx*, not unlike that of an acorn. This *fruit* after a while turns red, and finally blackish. The pulp is insipid, dry, and fungous, containing four or five *seeds*, or *nuts*, attached to the point of the fruit by four cords. Each *seed* is near two inches long, and one broad, compressed, roughish, of a fine brown colour. Sometimes there is but a solitary *seed*.

The Walan-tree grows, not very frequently, in the mountainous woods of Amboyna, where the soil is rich, and of a red colour. The only use made of it is to catch fish. For this purpose the roots are collected and prepared, with many foolish ceremonies. An entire root, with its bark, is beaten to pieces upon a stone, and when this is nearly accomplished, one person, of the party assembled on the occasion, commands all the rest to lie down at once in a circle, while he stands in the centre. They are to remain thus in perfect stillness, till one of them crows three times, like a cock, upon which they start up all together. While the bruising of the root goes on, they are forbidden to speak, cough, or spit, or to make any noise whatever. The powder of the root thus prepared is collected into baskets, and taken very early in the morning, about the crowing of the cock, to the river side. It is there thrown, by a handful at a time, into the water, and stirred about till a foam is raised to the height of several inches. This being accomplished, the whole party present lie down as if dead, but if any one of them crows, they all start up. While the powder is mixing with the water, no one may go within sight of the river, except with some cutting instrument, for fear of defeating the whole intention. At some distance, lower down in the stream, a net is placed across, which in the course of an hour becomes filled with fish, floating, half dead, upon the surface of the water; the acrimony of this root causing such an irritation in their eyes, as they cannot endure. If thrown into fresh water, they recover. Fish thus caught are wholesome for immediate eating, but will not keep for any time. Rumphius employed his servants successfully to catch fish in this manner, omitting, as may be supposed, the above-mentioned peculiar ceremonies. Persons who bathe in the water thus impregnated, feel only a slight itching of the skin; but the same water is not good for drinking. The natives of Amboyna restrain the exercise of this kind of fishing, to persons of particular families; and endeavour to promote a belief that others, who should attempt it, would be afflicted with incurable ulcers, or malignant cutaneous disorders.

WALBACH, in *Geography*, a town of France, in the department of the Upper Rhine; 4 miles S.W. of Colmar.

WALBECK, a town of Germany, belonging to the principality of Halberstadt, insulated in the duchy of Mecklenburg; 24 miles S. of Halberstadt.

WALBY, a town of Sweden, in the province of Upland; 23 miles S.S.W. of Upsal.

WALCA, a town of the duchy of Warsaw, on a lake; 56 miles N. of Posen.

WALCHEN SEE, a town of Austria, on the Atter See; 4 miles S.W. of Voglabruck.

WALCHEREN, the most westerly and most considerable island of the state of Zealand, about thirteen miles from north to south, and eight from east to west; situated in the German sea, at the mouth of the Scheld. Middleburg is the capital. N. lat. 51° 34'. E. long. 3° 29'.

WALCHEREN or *White Carrot*, in *Agriculture*, a sort of that root, which is said to be cultivated there with much success and advantage, as some sorts of the parsnip are in the island of Guernsey. See a paper on the latter subject in the first volume of the "Memoirs of the Caledonian Horticultural Society."

WALCKENSTEIN, in *Geography*, a town of Austria; 2 miles N.W. of Eggenburg.

WALCKERSBRUN, a town of the territory of Nuremberg; 3 miles W. of Grafenberg.

WALCOUR, a town of France, in the department of Gemappe, on the Heure. It was surrounded with walls in the year 910; 21 miles W.S.W. of Namur.

WALD, a town of the duchy of Berg. Here is a manufacture of knives; 4 miles N.W. of Solingen.—Also, a town of Austria; 3 miles S.S.E. of St. Polten.

WALDACH, a river of Wurtemberg, which rises 3 miles E.S.E. of Dornstett, and runs into the Nagold, about two miles S. from Nagold.

WALDAU, a town of Silesia, in the principality of Lignitz; 5 miles N.W. of Lignitz.

WALDAW, a town of Prussia, in the province of Samland; 8 miles E. of Königsberg.

WALDBECK. See WOLBECK.

WALDBURG, a town and castle of Germany, which gives name to a county, situated between the Iller and the Danube; 7 miles N. of Wangen.

WALDEBA, a town of Abyssinia; 5 miles S.W. of Siré.

WALDECK, a county of Germany, bounded on the north by the bishopric of Paderborn, on the east by Hesse, and prefecturate of Fritzlar, in the electorate of Mentz, on the south by Hesse, and on the west by the duchy of Westphalia. The length is computed at twenty-four miles, and its breadth twenty. The county abounds in grain and cattle, having also large woods, and the mountains in it contain lead, iron, and copper, and even some gold, which is esteemed equal in value to that of Hungary. Of the gold which is gathered out of the Eder, the princes have caused medals to be struck, and a magnificent sideboard to be made. Some parts also afford marble, alabaster, slate, and turf. This county contains thirteen towns and a market village. The greater part of the inhabitants are Lutherans, and the rest Calvinists, with some Roman Catholics intermixed. The manufactures are, coarse cloth, barragon, callimanco, dimity, rateen, and other stuffs; as also paper, and great quantities of iron-ware, for exportation. The county of Waldeck is thought to bring in above 100,000 rix-dollars *per annum* to the prince, and that not improbably, it being one of the most considerable counties in the whole empire, and preferable even to not a few principalities. The prince's circular contingency was two companies of foot, but he generally maintained three more.

WALDECK, a town of Germany, capital of a county of the same name, so called from an ancient castle, which has been repaired within the last century, and fitted up to receive a garrison; part of the records of the principality are kept here, and it is likewise used as a prison; 18 miles W.S.W. of Cassel. N. lat. 51° 13'. E. long. 9° 2'.

Waldeck, *Hohen*, a town of Bavaria, and capital of a lordship, formerly belonging to the princes of Waldeck, but which, in the year 1734, fell to the elector of Bavaria; 30 miles S.S.E. of Munich.

WALDEN, Saffron. See Saffron-Walden.

Walden, a town of America, in the state of Vermont and county of Caledonia, containing 455 inhabitants; 40 miles N. of Rutland.

Walden's *Island*, a small island in the North sea. N. lat. 80° 37′. E. long. 18° 10′.

WALDENBERG, a town of Westphalia, in the bishopric of Hildesheim; 13 miles S.E. of Hildesheim.

WALDENBRUCK, a town of Wurtemberg; 8 miles S. of Stuttgart.

WALDENBURG, a town of Germany, in the principality of Hohenlohe; 6 miles E. of Ohringen.—Also, a town of Saxony, in the lordship of Schonburg, on the Mulda. The old town of Waldenburg, which lies directly fronting Waldenburg, on the other side of the Mulda, is famous for its brown and white earthen-ware, which consists of vessels for laboratories and apothecaries' shops, together with pots of several kinds, such as pitchers, drinking vessels, &c. Here is likewise a considerable linen manufacture. It is a lordship, invested in the house of Schonburg, called Schonburg-Waldenburg; 44 miles W. of Dresden. N. lat. 50° 48′. E. long. 12° 21′.—Also, a town of Switzerland, and capital of a bailiwick, in the canton of Bâle; 15 miles S. of Bâle.—Also, a town and citadel of the duchy of Westphalia; 6 miles N. of Olpe.

Waldenburg, or *Wallenburg*, a town of Silesia, in the principality of Schweidnitz; 8 miles S.W. of Schweidnitz. N. lat. 50° 35′. E. long. 16° 5′.

WALDENFELS, a town of Austria; 3 miles N.W. of Freystatt.

Waldenfels, or *Wallenfells*, a town of Bavaria, in the bishopric of Bamberg; 34 miles N.E. of Bamberg.

WALDENGELOCH, a town of Wurtemberg; 5 miles N.N.E. of Goehsheim.

WALDENSES. See Vaudois.

WALDERSDORF, a town of Saxony, in the circle of Erzgebirg; 1 mile N.N.W. of Freyberg.

WALDHAUSEN, a town of Austria; 4 miles E.S.E. of Zwetl.

WALDHAUSER, a town of Saxony, in the Vogtland; 1 mile N.W. of Plauen.

WALDHEIM, a town of Saxony, in the circle of Leipsic, on the Zschopa; 25 miles S.E. of Leipsic. N. lat. 51° 4′. E. long. 12° 51′.

WALDKAPPEL. See Cappel.

WALDKIRCH, a town of the Brisgau, on the Elsach; 6 miles N. of Friburg. N. lat. 48° 7′. E. long. 8°.

WALDKIRCHEN, a town of Bavaria, in the bishopric of Passau; 10 miles N.N.E. of Passau.—Also, a town of Austria; 7 miles N.W. of Efferding.

WALDMICHELBACH, a town of Hesse Darmstadt; 8 miles N.E. of Heidelberg.

WALDMUNCHEN, a town of Bavaria; 30 miles N.E. of Ratisbon.

WALDNEUKIRCHEN, a town of Austria; 6 miles S.W. of Steyr.

WALDOBOROUGH, a sea-port town of America, in the district of Maine, and county of Lincoln, containing 2160 inhabitants; 50 miles N.E. of Portland. N. lat. 44° 2′. W. long. 60° 16′.

WALDRAN, a town of Austria; 8 miles S.W. of Aigen.

WALDRAPP, in *Ornithology*, a name given by some to the wood-raven, or *corvus sylvaticus* of Gesner, a bird of the size of a hen, of a glossy black, and adorned with a crest on its head.

WALDREICHS, in *Geography*, a town of Austria, near the Kamp; 10 miles E. of Zwetl.

WALDSAXEN, or Waldbach, a town of Bavaria, formerly imperial, but pillaged and almost destroyed in the wars of the Hussites and the Palatinate; since which it has never recovered itself. Near it is a rich Cistertian abbey, founded in the year 1133, the abbots of which were formerly princes of the empire. In 1802, this abbey was given to the king of Bavaria; 4 miles S.S.W. of Egra.

WALDSCHACH, a town of the duchy of Stiria; 14 miles S. of Gratz.

WALDSCHMIDIA, in *Botany*, a name given to the *Menyanthes nymphaeoides* of Linnæus, by Wiggers, in his *Primitiæ Floræ Holsaticæ*, 20; which, like Gmelin and a few other botanists, he considered as a distinct genus from Menyanthes; see that article and Villarsia. If, however, this opinion were correct, the name is forestalled by *Limnanthemum*, given to the same supposed genus by Gmelin, near twenty years before, and liable to no exception. *Waldschmidia* was intended to commemorate William Ulrick Waldschmidt, formerly professor at Kiel, who wrote a treatise on the sexes of plants, in which he is said to have well explained the use and physiology of the anthers.

WALDSEE, in *Geography*, a town of the duchy of Baden; 12 miles N.N.E. of Ravensperg.—Also, a lake of Stiria; 6 miles E. of Schlaming.

WALDSHUT, a town of the duchy of Baden, on the Rhine; 19 miles W. of Schaffhausen.

WALDSICH, a town of the county of Henneberg; 4 miles N.N.E. of Salzungen.

WALDSTADT, *i. e. The Forest Towns*, a name given in Switzerland to the cantons of Lucern, Uri, Schwitz, and Underwalden, probably on account of the quantity of forests found in them.

WALDSTADTER See, or *Lake of Lucern*, or *Lake of the Four Cantons*, one of the largest lakes of Switzerland, extending from Lucern to Altdorf, 20 miles in length. Its figure is very irregular, and it is for the most part surrounded with high mountains. The river Reuss passes through it. See *Lake of* Lucern and Lake.

WALDSTEIN, a town of the duchy of Stiria; 12 miles N.W. of Gratz.

WALDSTEINIA, in *Botany*, was so named by the late professor Willdenow, in compliment to a botanist of great eminence, Francis von Waldstein, author of the *Flora Hungarica*.—"Willd. Nov. Act. Soc. Nat. Scrut. Berolin. v. 2. 105." Sp. Pl. v. 2. 1007. Ait. v. 3. 204.—Class and order, *Icosandria Digynia*. Nat. Ord. *Senticosæ*, Linn. *Rosaceæ*, Juss.

Eff. Ch. Calyx in ten segments, the alternate ones smaller. Petals five. Styles club-shaped, deciduous. Seeds two, obovate, without awns.

1. W. *geoides*. Avens-like Waldsteinia. Willd. as above, v. 2. 106. t. 4. f. 1. Sp. Pl. n. 1. Ait. n. 1. "Waldst. et Kitaib. Hung. v. 1. 79. t. 77."—Native of umbrageous forests in Hungary, from whence it was introduced into Britain, by the late Mr. George Don, in 1804. A hardy perennial, flowering in June and July. *Aiton*. *Stem* ascending, round, striated, rather hairy, the length of the *radical leaves*, which are stalked, five-lobed, ribbed, somewhat

what hairy; their lobes obtuse, slightly three-cleft, toothed. *Stem-leaves* three-lobed, deeply toothed. *Stipulas* oblong, acute, entire. *Flower-stalks* two or three, terminal, thread-shaped, very long. *Flowers* yellow. This plant is allied to GEUM, (see that article,) but is distinguished by the small number of *pistils*, and the club-shaped deciduous *styles*. From POTENTILLA, (see that article and TORMENTILLA,) it differs widely in habit, number of *pistils*, and form of the *styles*. *Willdenow*.

WALDSTETTEN, in *Geography*, a town of Germany, in the marquisate of Burgau; 7 miles S.W. of Burgau.—Also, a town of the county of Wertheim, in the Spessart; 11 miles E. of Aschaffenburg.

WALDT, a town of Upper Bavaria; 8 miles S. of Neu Oetting.

WALDT *Aus*, a river of Austria, which rises on the borders of Bohemia, and runs into the Danube, 8 miles below Steyregg.

WALDTHURN, a town of Germany, in the county of Sternstein; 21 miles N.E. of Amberg.

WALDTNIEL, or NIEL, a town of France, in the department of the Roer; 2 miles E. of Ruremond.

WALDUBBA, a small province of Abyssinia, situated between the rivers Guangue and Angrab. Waldubba, signifying "the valley of the hyæna," is a territory entirely inhabited by monks, who have retired to this unwholesome, hot, and dangerous country voluntarily, to spend their lives in penitence, meditation, and prayer. This too is the only retreat of great men in disgrace or disgust. These first shave their hair, and put on a cowl like the monks, renouncing the world for solitude, and taking vows which they resolve to keep no longer than exigencies require; after which they return to the world again, leaving their cowl and sanctity in Waldubba. These monks, however, are held in great veneration, and are believed to have the gift of prophecy, and to work miracles; and they are very active instruments to stir up the people in the time of trouble. There are also women, who should be called nuns, that occasionally go to Waldubba, though not constantly resident there, and live in familiarity with these saints, not altogether consistent with their sanctity. A hermit and a nun sometimes sequester themselves for months, to eat herbs together in private upon the top of the mountains. These, on their return, are exhibited as wonderful patterns of holiness, lean, enervated, and exhausted. Mr. Bruce (Travels, vol. iii.) does not presume to decide, whether this change is to be wholly ascribed to the herbs, as he never was at these retirements of Waldubba. Those who inhabit this district are perpetually subject to fevers, and their colour is that of a corpse: many of them are destroyed by their neighbours the Shangalla; though it is said that they have been lately stopped by the prayers of the monks: but Mr. Bruce ascribes the discontinuance of the inroads of the Shangalla to the ravages of the small-pox, by which their strength and number are reduced, and whole tribes of them extinguished.

WALE, SAMUEL, in *Biography*, an artist of some celebrity in his day, was born in London, and was one of the founders of the Royal Academy. He was first engaged as an engraver on plate, but having studied drawing in the Academy in St. Martin's-lane, he applied himself to painting, imitating the manner of Francis Hayman. He executed several decorative pieces for cielings, but was chiefly employed in making drawings of historical designs for the booksellers, the greater part of which was engraved by Mr. Grignion. He assisted Gwynn the architect in his drawings, and as he had made himself acquainted with perspective, he was appointed the first professor in that science in the Academy. Upon the death of Wilson he was appointed librarian, and held both places till his own death, which happened in 1786.

WALE-KNOT, or WALL-*Knot, Single*, is made by untwisting the ends of a rope, and making a bight with the first strand; then passing the second over the end of the first, and the third strand over the end of the second, and through the bight of the first, and haul the ends tight. (See *Plate* I. *Rigging*, *figs*. 4, 5.)

WALE-*Knot, Double*, is made by passing the ends, singly, close underneath the first wale, and thrusting them upwards through the middle, only the last end comes up under two bights. *Fig*. 6.

WALE-*Reared*, an obsolete phrase, implying *wall-sided*.

WALEN, EL, in *Geography*, a town of Africa, in the country of Twat; 115 miles W. of Gadamis. N. lat. 22° 15′. E. long. 3° 30′.

WALENBURG, a town of the county of Henneberg; 5 miles N.W. of Smalkalden.

WALES, a large district or portion of Great Britain, situated at the north-western extremity of the island, and bounded on the north and west by the Irish sea, on the south and south-east by the Bristol channel, and limited on the east by the English counties of Monmouth, Hereford, Salop, and Chester. The length from north to south is, on an average, 150 miles; and the width from east to west 65 miles. This area comprises about 8125 square miles, or 5,206,900 acres of land: of which, it appears, by the reports to the board of agriculture, 900,000 acres are arable, and 2,500,000 under pasturage; leaving 1,700,000 acres in a state of waste, of which 700,000 acres are reported as capable of being brought into cultivation. Wales was formerly of greater extent, having for its boundaries the rivers Severn and Dee, as natural lines of demarcation. The ancient dimensions were, however, at various periods, contracted, by severing from it portions of the several counties, situated westward of those rivers; and taking out of it the whole county of Monmouth. The limits of the various districts of Wales, with the above exception, and their names, have been retained from a very remote period to the present time, independently of the modern arrangement of them into shires, as imposed by the English government. The division made in the time of Llewelyn ap Gruffydh, the last prince of North Wales, was into the three provinces of Aberfraw, Mathraval, and Dinevwr. In the distribution of these into cantrefs or hundreds, Aberfraw comprised fifteen, which were again subdivided into thirty-eight comots, or smaller districts; Mathraval, fourteen cantrefs, subdivided into fourteen comots; and Dinevwr, twenty-four, further divided into seventy-eight comots. Nearly similar to this, is the present civil division of the principality into twelve counties, six included in North Wales; *viz*. Anglesea, Caernarvon, Denbigh, Flint, Montgomery, and Merioneth; and six in South Wales, *viz*. Cardigan, Radnor, Brecknock, Glamorgan, Caermarthen, and Pembroke. The centurial divisions remain nearly the same as in Llewelyn's time. The whole contains 58 market-towns, and 751 parishes; and according to the enumeration made under the population act of 1811, the number of houses amounted to 123,512, inhabited by 611,788 persons; *viz*. 291,633 males, and 320,155 females: 36,044 families were returned as employed in trade, manufactures, or handicraft; and 72,846 in agriculture: and the average scale of mortality, according to registered burials, for a period of ten years, appears to have been in the proportion of 1 to 60 of the existing population. For the administration of justice, Wales is divided into four circuits,

cuits, *viz.* the Chester circuit, including the counties of Chester, Flint, Denbigh, and Montgomery: the northern circuit, for those of Anglesea, Caernarvon, and Merioneth: the south-eastern, for those of Radnor, Brecknock, and Glamorgan: and the south-western, comprising the three shires of Cardigan, Caermarthen, and Pembroke. By a statute, passed in the reign of Elizabeth, the king was empowered to appoint two persons learned in the law to be judges in each of the Welsh circuits, which before had but one justice. And by another statute of George II., it was enacted, that where the kingdom of England is mentioned in any act of parliament, the same shall be understood as comprehending the dominion of Wales, and the town of Berwick-upon-Tweed. Wales sends twenty-four members to the British senate, one knight for each shire, and one burgess for each county-town, except that of Merioneth; in lieu of which, two towns in Pembrokeshire return a member each, *viz.* Pembroke and Haverford-west. The eldest son of the kings of England has, ever since the time of Edward I., been invested with the title of prince of Wales: and several branches of the peerage derive their titles from various places in the principality.

Ancient History, Roman Stations, and Roads.—Cambria, the ancient name of this portion of the island, is deduced by historians from the original inhabitants having been a tribe of the Celtæ, or Gauls, known under the denomination of *Cimbri*, or *Cymri;* and the Romans called the country inhabited by such people Cambria. Wales appears to have been the acknowledged name of this region in the poetry of a Welsh bard, so early as the sixth century. The derivation of the Britons from the Gauls, both Cæsar and Tacitus deduce from the vicinity of the two countries, and the similarity of the manners and character of the people: but a stronger argument is found in the national appellation of Gael and Gaul, equally attached to both countries. It appears that the inhabitants of Wales were part of the aboriginal possessors of the island, whose numbers must have been greatly increased by those Britons, who, retreating before the victorious Romans, fled to this district, as a dernier resort, to preserve their independence. After the invaders had secured the central part of Britain, by forming stations, and appointing garrisons, and had given to it the name of *Britannia Prima*, they turned their attention to the reduction of the unconquered country lying west of the Severn. When Ostorius, the Roman general, surveyed this country, which he was sent with an army to subdue, he found it possessed by three tribes of people, denominated from their respective districts, Ordovices, Silures, and Dimetæ. The *Ordovices* possessed all the country comprised in the present North Wales: the *Silures* occupied the district now comprehended in the counties of Hereford, Radnor, Brecknock, Monmouth, and Glamorgan, and the small portion of Gloucestershire now west of the Severn; and had for their capital Caer-Gwent, in Monmouthshire: the *Dimetæ* were situated west of the Silures, and possessed the country at present including the counties of Cardigan, Pembroke, and Caermarthen. Such were the inhabitants of Wales, when the Romans first entered it with an hostile army. Respecting the condition or state of these Britons, at the period in question, a great difference of opinion prevails among our historians. Some, in despite of unexceptionable authorities, treat these people as illiterate savages, destitute of cloaths, dwellings, and arts: while others, following the British history, describe them as a martial, learned, and flourishing nation, possessing foreign trade, and at home erecting stately edifices. Both these accounts are probably much exaggerated. The best historians state that the Britons had a religion remarkable for its numerous ceremonies; they possessed an established government; and had regular and well-disciplined troops, divided into charioteers, cavalry, and infantry. With respect to any great naval power, though attempted to be proved by the learned Selden, well-founded objections may be urged; but as to smaller vessels, Cæsar bears ample testimony to the ingenuity of their construction, and their great convenience: the facility with which these vehicles were made, and their peculiar portability, has occasioned a continuance of their use, and *corracles* still form the fishing-boats employed on some of the rivers of Wales. They had sufficient corn for their support, and their pastures were abundantly stocked with cattle, sheep, and hogs. In their dealing with each other, for money they used rings, or small plates of iron strung together, which passed among them by weight, as well as tale: supposing they possessed no minted coins, this circumstance alone would be a sufficient evidence of their civilization; since it is deducible from history, that no nation in a state of barbarism ever adopted a circulating medium in buying and selling. From the earliest periods, the Britons breathed a spirit of genuine freedom, and always studied to procure and preserve their liberty. Stimulated by a noble ambition, never to be satisfied but by victory, nor extinguished but by death, they fought with a degree of bravery that astonished the legionary troops; and disputed every acre of ground with a tenacity and obstinacy that extorted from their conquerors the tribute of admiration. Suetonius Paulinus overcame the Ordovices, and extirpated the remainder of the Druids, and their followers, who had fled to the island of Mona, or Anglesea. Notwithstanding this, the heroic Silures for years continued their struggle for liberty, till at length Julius Agricola was sent with a powerful army by the emperor Vespasian; and having entirely defeated the Britons under their intrepid leader Caractacus, in a decisive battle near Caer-Caradoc, on the borders of Salop, he completely reduced that part of the island to the Roman yoke. The affability of Agricola gained the affections of the people, and disposed them to imitate the Roman manners: he bestowed on them the privileges of citizens; received them into his armies; provided for the education of their youth; and lived amongst them in a style of great hospitality. Thus, securing by policy what he had gained by force, Cambria was dignified with the name of *Britannia Secunda:* and the conquerors, as they had previously done in Britannia Prima, began to establish jurisdictions, and adopt measures for the due administration of the laws. Towns were built, stations appointed, and roads formed for communication between them. So speedily and successfully did they proceed in their settlement of this country, that in a few years Wales assumed all the appearance of a Roman colony. The following stations were then formed. *Caer Gybi*, Holyhead, in Anglesea;—*Segontium*, Caer-Seiont, Caernarvon;—*Varis*, Bodvary, in Flintshire, near Denbigh;—*Caergwrle* and *Holt*, also in Flintshire, appear to be scites of stations;—*Banchorium*, Bangor-Iscoed, on the banks of the Dee;—*Heriri Mons*, placed by Stukeley near Bala, in Merionethshire; but, with greater probability, at Tommen-y-mur, near Festiniog;—*Caer Gai*, in the vicinity of the former place, seems also to have been a station;—*Mediolanum*, Meivod, or Myfod, in Montgomeryshire; three other places in this county seem to lay claim to such honourable distinction, *viz.* *Penalet*, near Machynlleth; *Caer-Sws*, in the vicinity of Newtown; and the *Gaer*, near Montgomery;—*Magna*, Gale and Stukeley place at Old Radnor, but Horsley has removed it to Kenchester, near Hereford;—*Loventium*, Lanio-isa, in Cardiganshire;

diganſhire;—*Advigeſimum*, mentioned only in the Itinerary of Richard of Cirenceſter, is ſuppoſed by ſome to have been ſituated at Caſtel Fleming, and by others near Narberth, in Pembrokeſhire;—*Menapia*, the port for Ireland, near the preſent St. David's;—*Maridunum*, Caermarthen;—*Llanvar ar y Bryn*, in Caermarthenſhire, is evidently the ſcite of a ſtation;—*Leucarum*, Louchar, or Lougher, in Glamorganſhire;—*Bomium*, Boverton, near Ewenny;—*Nidum*, Neath;—*Tibia Amnis*, Caerdiff;—*Gobannium*, Abergavenny, in Monmouthſhire;—*Bleſtium*, Monmouth;—*Burrium*, Uſk;—*Iſca Silurum*, the capital of the colony, and reſidence of a prætor;—*Venta Silurum*, Caerwent; *Ad Sabrinum*, on the Severn, near the new or old paſſage.

Of the *Roman Roads*, though more diſtinct traces might be ſuppoſed to exiſt in Wales than in England, from their veſtiges not having been equally liable to obliteration from cultivation; yet for want of due inveſtigation, few of them have been traced in a ſatisfactory manner.—*Via Julia Maritima*, which received the name of Julia, from Julia Frontinus, who ſucceſsfully conducted the Roman arms againſt the Silures, is ſuppoſed to have connected the ſtations contained in the eleventh Iter of Richard of Cirenceſter. This road was a continuation of the Akeman-ſtreet from *Aquæ-Solis*, Bath; and directing its courſe weſtward acroſs the Severn, paſſed through Glamorganſhire, Caermarthenſhire, and Pembrokeſhire, to Ad Menapium, near St. David's: few traces of this road have been diſcovered.—*Via Julia Montana* was an upper road, forming a communication from the more central parts of the iſland, by the Ryknild-ſtreet, coming from Glevum, Glouceſter, and paſſing through part of Monmouthſhire, entered the county of Brecknock, proceeded over the mountains to Llanvair ar y Bryn, and thence along the vale to Caermarthen, where it coaleſced with the maritime or lower road above mentioned, and both terminated at St. David's.—*Via Occidentalis* appears to have extended along the weſtern coaſt of Wales, from Ad Menapium to Segontium, and formed connecting links between the intermediate ſtations.—*Via Devana* takes a direction through the centre of the principality from the ſouthern coaſt about Nidus, Neath, to Deva, Cheſter.—*Via Orientalis* took a north-eaſterly direction from Iſca Silurum, to Uriconium in Staffordſhire.—A branch of the *Northern Watling-ſtreet* entered Wales at Cheſter, and inclining to the weſt, paſſed the ſtation Varis, to Conovium, near Conway.—A branch of the *Southern Watling-ſtreet*, extending from Uriconium to Segontium, enters Wales near the village of Llandrinio, and proceeding to Mediolanum, is there met by the Via Devana; it afterwards joins the Via Occidentalis, and continues with it to Segontium. Numerous vicinal roads alſo traverſed the country from ſtation to ſtation, veſtiges of which are traceable in various places. A road of communication branched off from the Via Occidentalis at Penallt, and proceeded eaſterly to Caer Sws. Another road extended north-eaſterly from Llanvair ar y Bryn towards the ſtation on the river Ython, between which places it is diſcoverable on the extenſive waſtes in the vicinity of Llanrindod Wells. From Maridunum, a road leads to Loventium: the conſtruction is evidently Roman, being formed of various ſtratifications; is about thirty feet wide, and edged with ſtone. Another may be traced from Llanio, running eaſterly by Llanvair mountain, and paſſing through Caio, it goes to Llanvair ar y Bryn, thence to the Gaer near Brecknock, and ſo to the grand ſtation Glevum, Glouceſter. In ſeveral places, having the denomination of Sarn, traces of vicinal roads are diſtinguiſhable; and wherever this Britiſh word occurs, it is probable a Roman road paſſed near; as Talſarn, Penſarn, and Sarnau in Cardiganſhire. Numerous villas, ſudatories, aqueducts, walls, milliaria, or mile-ſtones, ſtatues, votive altars, inſcribed ſtones, teſſellated pavements, urns, pottery, bricks, tiles, medals, coins, and various other remains, have been diſcovered, which evidently point out the veſtiges of Roman reſidence, and by which the occupation of the country by the Romans may be clearly deduced.

Civil Hiſtory of Wales.—After domineering over Britain above four centuries, the Romans bade a final adieu to the iſland; which was ſoon expoſed to the inroads of numerous enemies. Aſſailed on the north by the Picts and Scots, it was equally infeſted by the Iriſh on the weſt. The native ſtrength of the country had been exhauſted by war; the number of its inhabitants further diminiſhed by famine and peſtilence; and the navy was fallen into decay. Under theſe diſadvantages, the people were alſo in want of that unanimity ſo eſſential in times of emergency. They had recourſe to their ancient form of government, and elected for their governors certain reguli, or chieftains; but theſe, inſtead of combining to oppoſe the common enemy by well-concerted plans of co-operation, were principally occupied in ſecuring their ſeparate intereſts. In this ſad ſituation, without union, order, or diſcipline, and attacked on all ſides by inveterate foes, the Britons adopted the moſt impolitic of all expedients for national ſafety,—that of calling in the aſſiſtance of one barbarous nation to drive out another; which ſubjected them to a new and heavier yoke. At this period, beſides the many chieftains under whom the iſland was divided, a perſonal competition exiſted between one who tyrannized over the reſt and held the ſovereign authority, named Gwtheyrn, or (as called by moſt Engliſh writers) Vortigern, and a chief of Roman parentage, called Ambroſius, but by the Welſh, Emrys Wledig. During this conteſt, Gwtheyrn, to repel the incurſions of the Scots and Picts, called in the aſſiſtance of the Saxons, an army of whom arrived under the command of Hengiſt and Horſa, deſcendants of Woden, the founder of their nation. The Saxon generals having driven back the enemy, and diſcovered the puſillanimity of the Britiſh monarch, turned their attention towards eſtabliſhing their troops, and ſecuring to themſelves a portion of the territories they had defended: this plan, through the treachery or incapacity of Gwtheyrn, they were enabled to accompliſh. The enraged Britons depoſed Gwtheyrn, and placed Emrys on the throne: he for a time prevailed againſt the Saxons, but freſh troops arriving under the command of Ella, they became victorious, and extended their territory. On the death of Emrys, his brother Uther, commonly called, from his office, Pendragon, was elected to the ſovereign dignity. The inteſtine warfare was carried on with varied ſucceſs between the Britons and Saxons; but numerous hordes continually arriving from the north, the latter became formidable in ſeveral parts of the iſland. Arthur, the celebrated ſon and ſucceſſor of Uther, for a ſeries of years conducted the war againſt the invaders; and in many deſperately-fought battles led on the Britons to deciſive victory. During the reigns of Uther and Arthur, the ancient Britons had attained the meridian of their glory; but it was now drawing to a cloſe: the death of Arthur decided the fate of Britain. Civil diſſentions prevailed among the Britons, which were promoted by their crafty adverſaries. During theſe troubles, many of the people ſubmitted to the Saxons and Scots; others, to preſerve their freedom, fled to Armorica, which, from the number of the refugees, acquired the name of Bretagne; ſome retired into the wilds of Devonſhire and Cornwall; ſome took ſhelter in the mountainous parts of the north of England; but by far the

greateſt

greatest number found an asylum in the fastnesses of Wales, where they defended and preserved their independence long after the expiration of the Saxon dynasty.

At the period when the Saxons had conquered the greater part of Britain, and made their approaches to the borders of Wales, this country appears to have been divided into six principalities, over which Maelgwyn, king of North Wales, was invested with the sovereign dignity, about the year 552. The contest was continued under several succeeding monarchs, till the death of Cadwallader, in the year 703, closed the imperial dignity, which for many centuries had been annexed to the British government; during which time the paramount princes chiefly resided at Diganwy, on the water of Conway, and at Caer Segont near Caernarvon. Roderic Moelwynoc nominally succeeded to the sovereignty in 720; but by continual and unhappy divisions, the strength of the country was so diminished, as to be unable successfully to resist the incursions of the Saxons. The Mercians, under king Offa, frequently laid waste the country, and at length wrested a portion from the Welsh princes; and to prevent the new occupants from the retaliating vengeance of the Welsh, Offa caused that famous boundary to be made, from the mouth of the river Dee to the Wye, which still goes under the appellation of Clawdd Offa, or Offa's Dyke. By this the region was considerably narrowed, and nearly reduced to its present limits. Though the Saxons made frequent inroads, yet they do not appear to have had any permanent footing in the country; so that though the pages of history record many sanguinary conflicts between them and the Welsh, yet scarcely any vestiges remain to mark the incursions of the invaders. The Danes called off the attention of the Saxons from Wales, which from this circumstance was left for many years in unusual tranquillity, and furnishes but few subjects of historical record during the Danish dynasty. The Danes made some incursions on the coast, but effected no permanent conquest of the country. On the accession of William I. to the throne of England, the Welsh having refused the annual tribute, which had been extorted from them as a mark of submission by king Edgar, the conqueror invaded their country with a powerful army, quickly awed them into submission, and obliged them to do homage, and take an oath of fealty, as due from vassals to their superior lord. From this period the English monarchs preferred a claim to Wales, as their heritable property. On the death of William, the Welsh, feeling the galling yoke of their humbled condition, attempted to recover their lost independence; and joining in revolt with some refractory English barons, entered England, and by fire and sword carried their devastation to the banks of the Severn. These outrages determined William Rufus to attempt the subjugation of the country; and for this purpose he excited his barons to conquer, at their own charge, under homage and fealty to him, the territories of the Welsh. These barons, who were denominated lords marchers, endeavoured to secure their conquests, by peopling them with English, and erecting strong fortresses to defend them from the inroads of the Welsh. Thus was the last asylum of the Britons broken into on every side, and invested by their enemies. South Wales was subdued; while North Wales, now greatly reduced, alone preserved the national character, and supported its independence; and the inhabitants, aided by the valour of their princes, still upheld the struggle; and acquiring vigour from union, dictated by necessity, not only prevented the marchers from achieving further conquests, but rendered their existing acquisitions of precarious tenure. For a long period the Welsh, favoured by the mountainous nature of the country, supported an unequal but spirited contest with their unjust invaders. The death of David, who had succeeded his unfortunate brother Llewelyn, in the reign of Edward I., closed the only sovereignty that remained of the ancient British empire. Edward having at length obtained the object of his ambition, by the entire conquest of Wales, annexed it to the crown of England. He did not, however, for some time, enjoy a tranquil possession; for three insurrections broke out at one time in different places. To such a height did these commotions arrive, that Edward was constrained to conduct the war in person, when he shortly compelled the insurgents to lay down their arms, and make an unqualified submission. These disturbances, the subsequent revolt of sir Gryffydd Llwdd, and the rebellion of Owen Glendowr, were the last efforts the Welsh made to recover their independence. From that period the concerns of the country, till the time of Henry VII., are little interesting; for the inhabitants were reduced to a state of the severest bondage. Henry VII., from the assistance the Welsh had afforded him in obtaining the crown, was more favourably inclined towards them than preceding monarchs, and granted the principality considerable immunities. Several ameliorating statutes were passed in the reign of Henry VIII., to exonerate them from the tyrannical oppressions of the lords marchers; and at length the people, awake to their true interest, solicited the king to give his liberal designs a more salutary effect, by extending to them all the privileges of the English jurisprudence. The prayer of their petition was granted, and Wales was formally united and incorporated with England.

Wales abounds with the remains of encampments, hill-fortresses, castles, and castellated mansions: specimens of military architecture, therefore, in the diversified styles of different and distant periods, constitute some of its most prominent and interesting features. While the Romans generally chose for the scite of their camps, or forts, a rising ground near some river, or a lingula formed by the confluence of two; the Britons selected the most lofty, insulated, and inaccessible mountains, the summits of which they fortified by excavating deep trenches in the solid rock, adding valla, by heaping up the loose stones dug out of the fosses; and in succeeding times, by adding strong walls, and erecting massy circular towers. The Normans introduced a new style of military fortification; and to secure their unjustifiable seizures, and proceed in their aggressions, they erected castles, more formidable both in number and extent, so that what are termed the marches of Wales consist of a series of fortresses from the mouth of the Dee to the embochure of the Wye. Flint, Denbigh, Montgomery, Powys, Brecknock, Caerphili, and Caerdiff, furnish bold examples of the style of those people. More were erected by the Anglo-Normans, as they progressively encroached on the country; for, to secure the conquered possessions from the retaliating vengeance of the expelled owners, they were necessitated to repair and strengthen the fortresses they took, or build others. Thus did these buildings so far increase, that Mr. Pennant enumerates 143 castles in the principality; and that number is probably short of the actual amount. On the conquest of Wales by Edward I., that monarch, who had been crusading in the holy land, and had there imbibed a spirit of eastern magnificence, for the purpose of overawing his new but refractory subjects, constructed three castles in a style, which for strength and grandeur have never yet been surpassed in this country. Harlech, Caernarvon, and Conway, remain the proud monuments of that monarch's age and times.

Ancient Constitution, Government, and Laws.—From the accounts given by the Roman writers, a monarchical form of

of government was prevalent among the early Britons. The island was divided into several petty sovereignties, each subject to a separate prince; but in time of emergency and danger, they were united in one, under an officer, similar to a dictator among the Romans, called a pendragon. To him, by joint consent, was committed the whole military government of the independent states. Nor was this dignity temporary, like the power; for though the latter appears to have ceased with the necessity that demanded it, yet the former continued for life, and was hereditary to the male heir. But the right of succession to the separate governments does not seem to be strictly indefeasible; for, in some instances, the lineal succession was violated by the rule of tanistry. By this the king's son, brother, or nephew, became the customary inheritor of the crown; the particular person being selected by the reigning monarch, with the advice of his nobles. This sovereign elect was denominated by the law the tanist, or second in dignity. The Britons were not unacquainted with that rational restraint on monarchical despotism, parliamentary suffrage; for a decisive argument in favour of the existence of British parliaments is found in the preface or introduction to the laws of the great Cambrian legislator, Howel Dda. Six of the most intelligent and powerful persons were summoned out of every cantreff, or hundred, to assist the king in the great work of legislation. This parliament being assembled, proceeded to examine the ancient laws, cancelled some, reformed others, enacted new ones, and digested all into one regular code of jurisprudence. This revision they presented to good king Howel, who having approved it, gave the ratifying sanction of royal authority. Both the monarch and parliament then imprecated the power of the state and the wrath of heaven upon any persons who should violate, or attempt to abrogate, any of these institutes, unless they should be constitutionally annulled in a national council, similar to the one in which they had been recently decreed. From the circumstances of this revision, many of those in the code of Howel Dda were pre-existent statutes, by which the early Britons had been regulated in previous times. From these it appears, that immediately below the sovereign ranked the Uchelwyrs, or great men holding their lands from the crown, and each presiding as lord over his particular domain. As immediate tenants of the king, they were obliged to perform certain services. Inferior to these, and holding from them as feudatory lords, were the general mass of the community, being in a state of villainage, but divided into two classes: first, such as might retain or relinquish their lands at discretion, possessed the power of buying and selling, and whose seignorial service was the least degrading of the menial kind; the other, denominated Caeths, were considered the property of the lord, attached to the soil, and saleable with the estate. These were bound to services the most servile, to build or repair houses for the Uchelwyr, and perform all the drudgeries of husbandry. Both were subject, like the chiefs, to military attendance in time of war, and to contributions in money or kind. Such were the tenures of lands in Wales, prior to the introduction of English customs, as appears by the laws of Howel Dda, not formed by him, but referable to previous institutes, ascribed to the early Britons. And as they were evidently feudal in their essence, and military in their design, the opinion of antiquaries, who deduced the introduction of a system of feuds into this island from the Normans, must be erroneous; for the laws in which it is found to have existed in Wales were collected into a digest, in the early part of the tenth century. The most prominent feature in the Howellian code is the law of inheritance, denominated *gavel kind*, by which the property was divided among the sons; the females of every degree being excluded till the utter extinction of the males, among whom no distinction was made between the legitimate and the spurious. While the Welsh preserved their independence, this law of descent universally prevailed; but on the conquest of the country by king Edward I., he directed certain commissioners to inquire upon oath into all the former laws and usages of the principality; and the first law promulgated by that monarch for the use of Wales was the celebrated statute of *Rhyddlan*. By this he permitted the ancient stem to continue, but lopped off two of its principal branches, *viz*. the admission of spurious offspring to the inheritance, and the preclusion of females. But in the 34th year of Henry VIII., the venerable trunk was for ever levelled with the ground, all the lands in Wales having been required "to be holden as English tenures to all intents." Since which period the laws of England, with the exception of a few formal peculiarities, have continued to form the jurisprudence of Wales.

Ecclesiastical History, Religion, &c.—The religion of the Britons, when Cæsar first visited the island, was of a kind peculiar to them, and to the kindred tribes of Gaul. It abounded with singular tenets, and the mode of worship comprised numerous superstitious rites, the remaining vestiges of which form some of the most interesting antiquities in the country. *Bardism*, or the Druidical system as it is generally called, has been variously represented; and the term *bard*, given to the Welsh poets who were not of the Bardic order, has tended to increase the confusion on the subject. What may be considered as the foundation of the order was the principle of universal benevolence, so that a bard was prohibited by his tenets from bearing arms; and being recognised as the herald of peace, he could pass, when clad in his azure robe, unmolested from one hostile country to another. The bards were divided into three classes, the *bard braint*, *ovydd*, and *derwydd*. To the bards braint belonged the perpetuation of the customs and privileges of the system, and of its moral and civil institutes; the ovyddon, or ovates, particularly attended to the cultivation of the arts and sciences; the derwyddon, or *druids*, were the priests who officiated in religion: from which circumstance, and from the great influence they consequently obtained over society, this class was most conspicuous, and became the general denomination of the whole.

Their origin, learning, religion, authority, revenues, decline, and extinction, have been fully detailed in this work under the article DRUIDS.

In the sixth century, the archiepiscopal seat of Wales was removed from Caerleon to Menevia, which was subsequently known by the appellation of St. David's. At that time the archbishop had under him three suffragans, the bishops of St. Asaph, Bangor, and Landaff. In the tenth century, St. David's lost its archiepiscopal honours; and in 1101, it became subject to the metropolitan see of Canterbury; to which, on the subjugation of the country by Edward I., the whole of Wales, as to ecclesiastical affairs, submitted; and at the dissolution of monasteries, the Welsh having been subjected to the English laws, the clergy in Wales were brought under the same regulations as those in England. And from the close incorporation of the two countries, the history of the church, after that time, is nearly similar in both. In Wales are many sects of what are considered regular Protestant dissenters from the established church, which had their rise in the reigns of James I. and Charles I., and more especially during the protectorate of Oliver Cromwell. But the greatest number of seceders from the established church are the different descriptions of Methodists, whose places of assembling,

aſſembling, multiplied over the face of the country, receive the appellation of chapels. Of this increaſing diſſent, one reaſon is aſſigned to be the generally illiterate ſtate of the regular clergy: for moſt of the livings in Wales are ſo ſmall, and the ſtipends of curates ſo ſcanty, that no inducement is held out for youth being properly inſtructed for the miniſtry, and conſequently the churches muſt be ſerved by incompetent miniſters. But this evil is likely ſoon to be remedied; for by the zealous endeavours of the preſent worthy biſhop of St. David's, two ſeminaries are inſtituted for the education of youth deſigned for holy orders, who are provided with tutors. Moſt places in Wales have the benefit of a free-ſchool; and in the year 1749, for the inſtruction of the children of the lower orders, 142 itinerant ſchoolmaſters were appointed by the ſociety for promoting Chriſtian knowledge. Thoſe among Proteſtant diſſenters have been provided for in this reſpect by the pious bequeſt of Dr. Daniel Williams, many years the reſpectable paſtor of a congregation in London, who left a large ſum of money for eſtabliſhing charity-ſchools, where ſuch inſtitutions were wanted; by virtue of which the truſtees have erected many in the principality.

The lovers of *eccleſiaſtical*, *monaſtic*, and *ſepulchral architecture*, will find ample ſcope for amuſement and admiration, in the remains of religious edifices, both in an integral and dilapidated ſtate, ſtill viſible in various parts of the principality.

Mountains, Lakes, Rivers, and Climate.—Wales exhibits all the features of a detached diſtrict from England, conſiſting of almoſt continued ranges of lofty mountains, and impending crags, interſected by numerous deep ravines with extenſive valleys, and affording endleſs views of bold, wild, or romantic ſcenery. To enumerate the mountains which are nominally known to the natives, and form very ſtriking objects to the traveller, would be ſuperfluous; but a general view of them, as they are grouped with multifarious ramifications, may be uſeful. The chains generally extend in a direction from ſouth-eaſt to north-weſt, having their eſcarpment, or moſt abrupt declivity, on the latter bearing. Numerous projecting ridges laterally expand on various parts of the compaſs, in countleſs ramifications, many of which are ſurmounted by lofty eminences, that are formed into ſo many diſtinct mountains, ſo that, like the Alps, they ſeem to be mountain piled upon mountain, and hills conglomerated upon hills. The principal range in North Wales is that denominated the *Snowdonian* chain, from the lofty mountain Snowdon occupying its centre. Commencing at Bardſey iſland, in the ſouth-weſt extremity of Caernarvonſhire, the line, varied at irregular intervals by conical peaks, extends in a north-eaſterly direction to the promontory of Penmaen-bach, in the bay of Conway. The intermediate parts conſiſt of the loftieſt mountains in Wales. The *Ferwyn* chain occupies the eaſtern part of Merionethſhire, and branches out into Denbighſhire. Its length is about ſixteen miles, and the breadth varies from five to ten; Cader Ferwyn, Cader Fronwen, and the Sylattin, are the moſt elevated points. Another line branches off into Montgomeryſhire, and joins the Breddin chain, extending into Shropſhire. Another chain, or rather a continuance of the ſame, extends in a ſouth-weſt direction from Pennant, near the vale of Tanad, in Montgomeryſhire, to the ſea-coaſt near Langyllinin in Merionethſhire. In this extenſive ridge are conſpicuous ſeveral lofty mountains, known under the appellation of the Arrans and the Arrenigs; the moſt eminent of which are Arran-ben-llyn and Arran-fowddy, and the extremity of the line is grandly marked by the triple head of the lofty Cadir Idris. The celebrated *Plinlimmon* proudly elevates his creſt above a range of table land, extending from the vicinity of Llanvair in the north-eaſt, till they decline in the ſouth-weſt, and end in the abrupt cliffs, which bound part of the bay of Cardigan, near Aberyſtwith. Among particular elevations in this line, after the ſovereign of the group, the Carno mountains ſtand the moſt pre-eminent. South Wales, though not equally mountainous with the northern part of the principality, nor ſo diſtinguiſhable for its Alpine heights, is yet far from being deficient in elevations and depreſſions. An extenſive chain of mountains ſtretches from Bleddva foreſt, north-eaſt of Llandrindod Wells, in Radnorſhire, croſſes the northern part of Brecknockſhire, continues in a ſouth-weſterly direction through Caermarthenſhire, and terminates in the conſpicuous ridge of the Preſcely or Preſcelau mountain in the county of Pembroke. The Fothoc hills, on the eaſtern ſide of Brecknockſhire, commence another line, principally known under the general appellation of the *Black Mountains*, from the appearance given to them by the dark vegetable covering of heath and ling. Among individual elevations, remarkable for their height, are Tre-beddw mountain, Pen Mallard hills, the black mountains ſtrictly ſo denominated, and the high table land which in the ſouth part of Caermarthenſhire is cloſed by the iſolated mountain, called Pembre hill. In this mountainous region, *lakes* are exceedingly abundant; an attempt to deſcribe, or even to enumerate them, would be endleſs: Mr. Gough reckoned from fifty to ſixty in Caernarvonſhire only. The moſt diſtinguiſhed for extent, or the beauty of the ſurrounding ſcenery, are, in North Wales, Lynian Nantle, Llyn Cywellin, Llynian Llanberris, and Llyn Conway, in Caernarvonſhire; with Pimble-meer, and Talyllyn, in Merionethſhire. In South Wales, Llyn Bychlyn, in Radnorſhire, and Llyn Savathan, or Langor's pool, in the county of Brecknock.

Rivers.—Wales, though a mountainous country, is equally remarkable with England for its numerous ſtreams, which iſſuing from conſiderable lakes, or aided by their waters, meander through the country, and form excellent harbours at their confluence with the ſea. The principal rivers are the Severn, the Wye, and the Towy, in South Wales; the Conwy, the Clwydd, and the Dee, in North Wales: theſe have not only attained pre-eminence in fame for the utility of their navigation; but, by poets, have been celebrated in ſong. The former conſtitutes the eaſtern, and the latter the north-eaſtern boundary of the country, between the embochures of which many others, though leſs diſtinguiſhed in a commercial point of view, are highly valuable for their fiſheries and other properties. Theſe, tracing their ſources in the order in which they unite their waters with the ocean, are, in North Wales, the Ogwen, Sciont, Gwynedd, Drwydd, Avon, and Dovey; in South Wales, the Rheidiol, Yſtwith, Eiron, Tivy, Nevern, Gwyn, Cleddy, Itrog, Taf or Tave, Loughor, Tawy, Nedd, Avon, Taf or Taffe, Rhymny, and Uſk. A particular deſcription of the moſt conſiderable, will be found under their reſpective names.

The *climate* of Wales differs materially from that of the portion of England, lying in the ſame parallel of latitude; and aſſimilates more with the northern parts of the iſland. In a general view the air is ſharp; in the mountainous parts bleak; moderately mild in the vales, and thoſe parts adjacent to the ocean, eſpecially on the ſouthern coaſt, and particularly in the celebrated vale of Glamorgan. From the greater degrees of cold prevalent in the Cambrian atmoſphere, ſnow is more frequent in Wales than in England, lies much deeper, and is ſeen covering the tops of the higheſt mountains, for many months in the year. The wet ſeaſon in this country is not uſually confined to the winter months; for

for rains are frequent at all times of the year. The gaged quantity of rain which annually falls in England, according to the experiments of Dr. Hales, is about twenty-two inches; while the average that deſcends in Wales may be eſtimated at thirty-four. From numerous obſervations reſpecting this ſubject, the reſult has uniformly been, that more falls on the weſtern than on the eaſtern ſide of the kingdom, and moſt in the mountainous diſtricts; conſequently Wales muſt participate largely in ſuch an exceſs of humidity. In the year 1802, the quantity of rain which fell in London was fifteen inches, and in Brecon twenty-ſix inches. Moiſt as the climate of Wales muſt conſequently be from this vaporous ſtate of its atmoſphere, yet the air is in general highly ſalubrious, and the country healthy. Scarcely a cemetery in the principality, but bears ſome teſtimony to the longevity of the inhabitants, even to the protracted age of a century, and in ſome inſtances even to a greater extent.

Natural Productions and Minerals.—Few countries can vie with Wales in the multifarious variety of its productions, while none perhaps have been ſo long and undeſervedly neglected. Some animals, rarely to be met with, frequent the wilds of this diverſified country. The goat is here found in its ferine ſtate, and is far ſuperior in ſize, and in the length and fineneſs of his hair, to that of moſt other mountainous countries. Though this uſeful animal has been long domeſticated, yet many of the inhabitants of North Wales ſuffer the goats to run in a wild ſtate, and bound from crag to crag. Theſe they are accuſtomed to kill during autumn for the ſake of the fat and ſkins: thus goat-ſhooting and goat-hunting are ſtill practiſed by the people in Wales. Roebucks were anciently numerous, but are now confined to the moſt intricate parts of the country, and they are rarely to be ſeen. Of the feathered tribes, many ſpecies, not found in other parts of the iſland, are to be met with here. The golden eagle is an inhabitant of the Snowdonian mountains, which thence are ſuppoſed to have derived their appellation of the Eagle rocks. The peregrine falcon, ſuppoſed to be the bird which furniſhed the amuſement of falconry to our anceſtors, and formed a ſort of criterion for nobility, breeds abundantly among the rocks of Llandidno, in Caernarvonſhire. The merlin, uſed in hawking, migrates from Wales to England generally in September. The water rail is found in Angleſea, early in the ſpring; and immenſe flocks of puffins viſit the iſland of Prieſtholme about the ſame time. The guillemot, and the black-backed gull, frequent the Welſh coaſt during the winter. Among the numerous fiſh, which abound in the rivers of Wales, in addition to thoſe generally known in England, may be noticed the crooked perch found in Llyn Raithlyn, Merionethſhire, and the deformed trout, ſaid to be peculiar to a brook, called Syrcian, in Cardiganſhire: (theſe two ſpecies are deſcribed by Daines Barrington, in a communication to the Royal Society 1767): alſo the ſamlet is frequent in the upper part of the Severn and the Wye; the ſewin, the red char, the ſilver char, and the gwiniad. Some of theſe, however, are not excluſively peculiar to the principality, but are found in ſome of the rivers of Scotland, and in the lakes of Weſtmoreland and Cumberland.

The *mineral* productions of Wales form the moſt intereſting part of the ſubject, and furniſh an inexhauſtible ſource of profitable inveſtigation to individuals, and of national wealth. The mountains and hills may be ſeparated into three diſtinct claſſes, *viz.* primitive, ſecondary, and derivative, which in a general view may alſo be diſtinguiſhed by the peculiarities of their form, as well as their relative ſituation. Primitive granite mountains conſiſt of craggy ſteep rocks, tending in the aſcent more or leſs towards an acute or ſlender pointed ſummit, the loftieſt mountains are centrically ſituated in the chain, which commencing and terminating in abrupt precipices, with the inſulated peaks that interrupt the general outline, form a ſtriking and diſtinctive character. Secondary mountains, chiefly compoſed of ſchiſtoſe ſubſtances, range next in the ſcale, and are diſtinguiſhable from the former by their inferior height, the evenneſs and ſquareneſs of the individual links which compoſe the chain, and by the eaſy waving though varied line of the general contour: inſtances of which are conſpicuous in the Ferwyn and Breddin mountains previouſly noticed. Derivative, or calcareous and ſiliceous hills, range conſiderably lower than the ſecondary or ſlate mountains, uſually riſing by a gradual aſcent at one extremity, and terminating abruptly at the other. The lime-ſtone hills frequently aſſume a pyramidical ſhape, while the ridges of the ſand rocks, and banks, are broader and rounder than thoſe of lime. Theſe, however, often trap into each other, and then little diſſimilarity is diſcoverable in their form. The primitive mountains in maſs contain no metals; copper is however found in ſeveral of the horn-ſtone ſtratified mountains, of which the Parys mine, and thoſe at Llanberis and Pont-Aberglaſlyn, are examples. In theſe mines, the ore is for the moſt part yellow, ſulphuret of copper, the green and blue malachites or carbonates of copper, are found in lime-ſtone, as at Ormes-head and Llanymynech hill, where copper is not produced in any other ſtate but that of carbonate, which is alſo found in the calcareous cement of ſand rocks. The ſtrata generally moſt productive of the metallic ores are lime-ſtone; and moſt ſpecies of whin-ſtones, or the argillaceous mountain rocks, of which there are many varieties appearing in thick, thin, and mediate ſtrata; ſome of theſe rocks are moderately and others exceedingly hard. They aſſume various colours, though principally one or other of the numerous ſhades of grey. Several rich and valuable mines are diſcovered in granite or moor-ſtone mountains. Theſe three orders or claſſes of rocks, with their concomitant ſtrata, are uſually interſected by mineral fiſſures, and contain the largeſt quantity of mineral ſubſtances, and metallic ores. But of all claſſified ſtrata, in which the richeſt mineral veins have been diſcovered, the indurated argillaceous mountain rocks are the moſt prolific and extenſive. Many of the mines in North Wales, nearly the whole of the numerous valuable lead mines in the county of Cardigan, and moſt of the mines in other parts of South Wales, are found in this kind of matrix or ſtrata. The principal ſubterraneous ſubſtances produced in Wales, may be divided into three claſſes, metalline, mineral, and lapideous; and the places where they are dug receive the diſtinctive appellations of mines, pits, or quarries. *Silver* is obtained in conſiderable quantities, though not at preſent found in what may be excluſively denominated ſilver mines. Cwmſymlog mine in Cardiganſhire conſiſts of ſilver ore, lead ore, and quartz; which, from the rich produce of the more precious metal, received the appellation of the Welſh Potoſi. Daren vawr, Daren vach, Goginan Cwm Evyn, and Mynydd bach, contain ſimilar ſubſtances to thoſe of Cwmſymlog, though not equally productive of ſilver. Llanvair is at preſent the richeſt mine worked in the principality; compriſing ſilver, lead, quartz, ſpar with a ſmall portion of copper, and yields about one-ſixth of lead ore. About ſixty to eighty ounces of ſilver are extracted from a ton of ore, and twelve hundred and a half weight of lead. *Copper*, which was known and appreciated by the Romans while in poſſeſſion of Britain, is abundant through different parts of the iſland, but was not an object of commercial inveſtigation till within

about

about two centuries paſt; nor in Wales to any conſiderable purpoſe till the middle of the laſt. The copper works of the Romans lay for ages neglected; and to the public and enterpriſing ſpirit of Nicolas Bailey, the country owes the revival of reſearch for this valuable metal. Parys mountain in Angleſea conſiſts wholly of copper, either in a ſtate of native copper, ſulphate, black ore, or malachite: the matrix is a dark grey chertz, and the ſuperſtratum aluminous ſlate. The copper ore found at Llanberris in Caernarvonſhire, is of a very ſuperior quality to that of Parys mountain, yielding from eight to ten *per cent.* weight of metal. This ore ſubſiſts in the primitive ſtratified rocks, and generally in a matrix of ſchiſtoſe hornblende, or quartz. The ſame mountainous ridge, conſiſting principally of whin and horn-ſtone, divided by the immenſe chaſm over which is thrown the bridge called Pont-aberglaſlyn, contains another copper mine producing ore ſimilar in quality to that of Llanberris; and it is highly probable the whole of this diſtrict is pregnant with copper. Eſcair vraith mine in Cardiganſhire conſiſts of copper ore, ſpar, quartz, and a ſubſtance, termed by the miners gozin, which forms an envelope to the quartz. *Lead*, for which this iſland was always famous, is found in a variety of places through Wales, but particularly in the counties of Flint, Caernarvon, Montgomery, Caermarthen, and Cardigan; indeed the latter may be conſidered as the moſt extenſive and richeſt mining field in Britain. A mineral tract ſtretches from Pen-yr-allt, or Bryndigri, in a line to the weſtern borders of the pariſh of Holywell in Flintſhire, and is known under the name of Whiteford rake. The ores differ in quality; the lamellated, or common kind, uſually named potter's ore, yields from fourteen hundred to ſixteen hundred and a quarter of lead, out of twenty hundred of the ore: but the laſt produce is rare. The veins are found either in chert or lime-ſtone rocks, and ſome of the beſt ore has been dug at the depth of ninety yards. In this tract ſeveral levels have been driven and ſhafts ſunk, and lead continues to be obtained in very conſiderable quantities. Between Gwydir and Capel Cerrig in Caernarvonſhire, within an extenſive dip between lofty mountains, are very extenſive lead works. The ſurrounding rocks conſiſt of ſlate, bituminous ſhale, and trap or whin; the matrix of the ore is quartz, and calcareous ſpar; they produce lead and calamine, mixed with iron ochre, and a ſmall quantity of copper pyrites. Theſe different ſubſtances are ſo blended, that in the ſame ſpecimen a variety of them may be found. But Cardiganſhire may be peculiarly denominated the region of lead mines, the whole country apparently having its rocks cemented together with veins of this metal. For a vaſt extent the land is excavated, and the ſurface covered with the opening of mines already worked, or the veſtiges of numerous others that have furniſhed their ſubterraneous treaſures to remote generations. The principal lead mines in this county are Cwm-yſtwyth, Llewerneg, Inys Cynvelin, Penybanch, Bron-y-goch, Llwynwnwch, Grogwnion, Gellan Erin, and Nant-y-Crier. The ore found in moſt of the Cardiganſhire mines is nearly of a ſimilar nature, conſiſting chiefly of lead, mixed with quartz and ſpar, accompanied frequently with quantities of an ore of zinc, denominated by the miners, from its dark appearance, black jack. This, which formerly was appropriated to the repair of the roads, has lately been diſcovered to be a valuable article, conſtituting an excellent flux for braſs; and, mixed in due proportions with copper, makes a hard metal, ſimilar to the orichalcum of the ancient Romans. *Iron*, the moſt uſeful, and through the wiſe diſtribution of Providence, the moſt common of all metals, is plentifully diſperſed over the Britiſh iſles; and Wales is not deficient in this particular. Yet, notwithſtanding the mountains of this country are full of iron-ſtone, it was not till within about half a century, that the public attention was turned to this inexhauſtible ſource of internal wealth. Iron is moſt abundant in South Wales, though evident marks of its exiſtence may be traced in North Wales; and it has lately been procured, and works erected in the vicinity of Ruabon in Denbighſhire. The ſeveral ſpecies of iron which have been diſcovered are hematites, kidney ore, or compact brown iron-ſtone; grey ore, or black iron-ſtone; bog ore ſwampy iron-ſtone; and a variety of ſulphurated and arſenical ores, which claſs under the general denomination of pyrites; but the kidney and grey ores are the moſt frequently found. The principal iron works are Merthyr Tydvil, Aberdare, and Cyfartha, in Glamorganſhire; and the Union, Llanelly, Beaufort, and Hirwan, in Brecknockſhire. *Coal* is found in every county of Wales except Cardigan, Merioneth, and Caernarvon. The coal ſometimes underlays the calcareous ſtrata, or, in the miner's phraſe, has a lime-ſtone roof; but more frequently it is found on the northern or ſouthern ſide of a lime-ſtone ridge; and when a tract of low land is included between two ſuch ridges, it may be inferred, that coal lies beneath. Two parallel lines of calcareous ſtrata extend through South Wales in an eaſterly direction, from St. George's Channel acroſs the whole country. Theſe are accompanied by two lines of coal. Upon the upper line, coal has been found at Johnſton, Picton, Jeffreſton, and Begeley, in Pembrokeſhire. Thence keeping on the ſouthern ſide of the lime-ſtone ridge, it croſſes the Towy, forming the bar at the mouth of that river; and paſſing through the upper part of Caermarthenſhire, Brecknockſhire, and Monmouthſhire, croſſes the Severn to the collieries of Kingſwood near Briſtol. The different ſpecies of coal in Wales are the newcaſtle, the rock, the ſtone, or ſplent, the cannel, or parrot, and the culm, or blind coal, denominated in England Welſh coal, becauſe almoſt peculiarly the produce of Wales. Some varieties of the cannel coal are ſo fine and ſolid in the contexture, and ſo ſuſceptible of a high poliſh, as to be capable of being turned in the lathe, and formed into various utenſils, toys, and trinkets. The ſchiſtoſe mountains of Wales afford another ſubſtance, if not of equal importance, yet of general utility. *Slates*, cuſtomarily called Corniſh tile, becauſe originally procured from Cornwall, conſtitute an elegant and uſeful roofing to houſes much cheaper than lead, for which it is latterly become a very common ſubſtitute. Slate quarries are numerouſly ſcattered over the country, but the principal are thoſe of the Rheidiol near Aberyſtwith, Cardiganſhire; Llangynnog, Montgomeryſhire; and the extenſive ones in Snowdonia, Caernarvonſhire. Thoſe of the former place produce ſpecimens of the large and coarſeſt kind of ſlate, which lie in compact maſſes, reſembling flag-ſtone, of a rough texture, but ſeparating eaſily into large plates. Llangynnog ſlate alſo divides into large plates, is not of quite ſo coarſe a quality, and forms a very profitable building article. Theſe quarries, Mr. Pennant obſerves, yielded from November 1775 to the ſame month in the following year 904,000 ſlates, which were ſold from ſix to twenty ſhillings per thouſand. The Snowdonian ſlates are generally of a very fine grain, a beautiful blue colour, and when quarried ſeparate into exceedingly thin laminæ; properties, which render them particularly eligible for handſome roofing, and manufacturing into writing ſlates. So great have been the quantities of late years procured from this diſtrict, that a ſmall inſignificant creek has been dignified with the name of Port-Penhryn, from the export trade of this article only. On viewing the different apertures of the ſchiſtoſe mountains,

tains, a ſtriking geological fact will reſult, correſpondent with the principle of uniform though unequal declivity. It is obſervable that the ſlates are always coarſeſt in their texture on the northern or north-weſtern ſides of the ridge, and leſs ſo on the ſouth and ſouth-weſtern ſides; becoming gradually finer as they approximate the lime-ſtone hills. Wales affords numerous quarries of other valuable ſtones; *viz.* different kinds of marble fit for monuments, columns, chimney-pieces, and other ornamental ſculpture; ſerpentine and other ſpecies of horn-ſtone; chert or petriſolex, and pure quartz, for the uſe of the potteries. Nor ſhould that rare and curious ſubſtance be omitted, which furniſhes the aſbeſtus, indeſtructible by fire, found on the ſhores of Angleſea. The mona marble, from the iſle of Angleſea, is now much uſed in chimney-pieces and fancy furniture. (See MARBLE, *Britiſh.*) The Britons, as already obſerved, underſtood the uſe of metals, and were further inſtructed in the arts of mining by the intelligent Romans; but after the departure of the latter, ſelf-preſervation occupied the attention of the natives, and peaceful ſcience ſunk under the devaſtating hand of war. Yet their mines were not wholly neglected, for it was probably by means of this ſubterraneous wealth, that the Welſh were enabled to ſupport againſt the Engliſh an unequal warfare for ſo long a time. During centuries after the conqueſt, in England the crown aſſerted its excluſive right to all mines and minerals; and no perſon could ſearch for ore unleſs empowered by a royal grant, under conditions impoſed at the diſcretion of the monarch. Edward I., on his conqueſt of Wales, extended his mining authority over that country; and it does not appear that the proprietor of the land, on which a mine was opened, had any ſhare in the profits, till the reign of Henry VI., when the duke of Bedford having obtained a leaſe of all mines containing any gold or ſilver, a reſervation was made of a twentieth part of the proceeds to the owner of the land. Queen Elizabeth, however, adopted a ſound policy: ſhe ſent over for ſome experienced Germans, and granted letters patent to them and their heirs for ever, to ſearch for and conduct the buſineſs of mines, through ſeveral ſpecified Engliſh counties, and the whole principality of Wales. The patentees divided part of their tenure into ſhares for ſale; and with the purchaſers of ſuch ſhares, they were incorporated by the ſtyle of the "governor, aſſiſtants, and commonalty of the mines royal." But though the foundation was thus laid for the preſent ſucceſs in mining, yet little of importance was effected till the reign of Charles I. According to the teſtimony of Schlutter, the lead mines in Flintſhire were not worked before the year 1698, when Dr. Wright and his aſſociated adventurers eſtabliſhed a ſmelting-houſe at Halkin. The ſubſequent extenſion of mining concerns was encouraged by the repeal of former reſtrictive ſtatutes, and by the enactment in the firſt year of William and Mary, that perſons having mines ſhall enjoy the ſame, although claimed as royal mines; the king having the right of pre-emption in the ore at certain regulated prices.

Agriculture, Bridges, Roads, and Canals. Wales in a general view may be conſidered a century, at leaſt, behind England in its ſtate of agriculture. The mode of ploughing, the courſe of crops, the deficiency of manure, the want of draining, and the rude implements of huſbandry, are ill calculated for making a progreſs in agricultural amelioration. Many of the errors evidently ariſe from the ignorance, prejudice, indolence, and poverty of the tenants; but other cauſes are attributable to the proprietors of eſtates. One is, not granting proper leaſes, the lands for the moſt part being let from year to year; a ſtill more injudicious cuſtom is the letting farms by auction. But though this is the general ſtate of agriculture, yet ſtriking and honourable inſtances occur, in divers places, of more rational conduct. Many gentlemen are ſetting the example of the moſt improved practice; and almoſt in every county, aſſociations of intelligent agriculturiſts have been formed for the introduction and encouragement of a better ſyſtem of huſbandry. From the nature, as well as number of the rivers in Wales, the erection of bridges muſt have excited, at an early period, the attention of the Welſh. Inſurmountable barriers muſt have been oppoſed to the traveller, without the aid of what may be termed pendent bridges; that is, ſuch as are thrown from crag to crag, at a prodigious height above the water. Of this kind is the bridge, or rather two bridges, called Pont-ar-Mynach, near Hafod, in Cardiganſhire, forming a paſs over an awful yawning chaſm, through which the river rolls its waters to the Rheidiol. Another, called Pont-aber-glas-lyn, forms a communication over a narrow defile in the mountainous ridge ſeparating the counties of Caernarvon and Merioneth. Numerous bridges, of a ſingle arch, are ſcattered over the country; of this claſs is the celebrated Pont-y-Prydd, croſſing the boiſterous Taffe in Glamorganſhire. Among thoſe bridges compoſed of more than one arch, the triangular-arched bridge over the river Dee at Llangollen, is curious for its mode of conſtruction, and great antiquity: the bridge acroſs the Conwy, near Llanrwſt, is an elegant ſtructure, and does honour to the ſkill of its architect, Inigo Jones: the bridge of five arches at Bangor-iſcoed, in Flintſhire, is a fine ſpecimen of architecture. The town of Caermarthen is entered by a long ancient bridge; but the ſtupendous aqueduct, by which the continuation of the Elleſmere canal is carried over the Dee, at Pont Cyſſyllte, between Llangollen and Chirk, in Denbighſhire, is the chef d'œuvre of this ſpecies of architecture; and can only be exceeded in grandeur or utility, by the projected bridge over the Menai ſtraits, by which it is propoſed to form a land communication between the county of Caernarvon and the iſland of Angleſea. Wales, though long famed for its bridges, was, till of late years, nearly a ſtranger to good roads. Except the two great mail-roads, forming the communication with the north and ſouth of Ireland, by the way of Milford and Holyhead, whence the packets ſail for that country, ſcarcely a road could be found, calculated for the paſſing of carriages. But to this eſſential point for profit and convenience, the land proprietors have recently directed their attention with the moſt beneficial effects; and the country may now be traverſed in almoſt every direction. Under the auſpices of that public-ſpirited nobleman, the late lord Penrhyn, a grand road has been cut through the immenſe range of lofty mountains, denominated Snowdonia, by which an extenſive communication has been opened between the internal parts of North Wales and the coaſt; and the great thoroughfare from London to Dublin by way of Holyhead diminiſhed in length, compared with the former one by way of Shrewſbury and Conway, twenty-five miles. Numerous roads have been widened, ſhortened, and otherwiſe improved, by the addition of drains, arches, bridges, &c. to the great accommodation of travellers, and general benefit of the inhabitants. Already has the country begun to experience the advantages by new communications having been opened for the produce of the interior, in the reduction of the rate of carriage, and in the eaſy acceſs thus afforded for the conveyance of ponderous articles to the ſea-coaſt, or to the inter-communications with the navigable rivers by inland canals.

Improvement by internal navigation was long neglected in this country, though equally capable of ſuch advantages

as England. In North Wales, the first project which engaged the attention of the landed interest, was the junction of the navigation on the rivers Severn and Dee, by opening an aquatic communication through the counties of Denbigh and Flint, with various ramifications into the mining and manufacturing districts in the adjacent counties. This is called the Ellesmere canal, connected with which is the Montgomery canal. Those in South Wales are the Kidwelly, Cardiff and Merthyr Tydvil, Aberdare, Neath, Brecknock, and Swansey canals. For a particular description of each, see their respective names under the article CANAL.

Manufactures, till within these few years, were not very extensively diffused, nor could be considered of much account in the general scale of productive industry. Wales, however, has for centuries been celebrated for its flannels, and may be considered as standing unrivalled in this useful article. The woollen substances manufactured are webs, flannels, stockings, wigs, gloves, and socks. Webs are distinguished by the trade into two sorts; the strong or high country cloth, and the small or low country cloth. Strong cloth is made in Merionethshire, and principally in the vicinity of Dolgelly and Machynlleth: at the latter place is a manufactory upon a small scale, a circumstance only worthy of notice, as forming the commencement of a change in preparing the wool, which will probably soon become general. The standard width of this cloth is seven-eighths of a yard; the length of a piece, or what is emphatically styled a web, is about 200 yards; the quality is of various degrees. Small cloth is the produce of Denbighshire; it is chiefly manufactured within the parish of the Glynn, a large tract of country including Llangollen and Corwen. This article is about one-eighth of a yard narrower than strong cloth; the length is the same. Flannel constitutes the most important of the Welsh manufactures: it is chiefly the produce of Montgomeryshire; but by no means confined to that county, being made in various places within a circle of about twenty miles round Welshpool. A manufactory of note has been established a considerable time at Dolobran; and two on a large scale have been recently erected near Llanydloes, where the various machines, used in the woollen trade by the English, are applied to the purposes of manual labour. The principal markets for webs and flannels are Welshpool and Shrewsbury; the quantity made is not easily ascertained. Mr. Pennant, in his Snowdonia, published in 1781, mentions, that there were brought "annually to Salop 700,000 yards of webs; and to Welshpool annually between 7 and 800,000 yards of flannel." Stockings, wigs, socks, gloves, and other small knit articles, are sold chiefly at Bala, Merionethshire, being made in that town and neighbourhood. Stockings, to the amount of from two to five hundred pounds worth, are sold each weekly market-day. Very considerable manufactories of cottons and cotton twist have been established in the counties of Flint and Denbigh, the principal of which are Northop, Greenfield, Sceiving, Newmarket, and Denbigh. In some of these factories cotton yarn is spun of so fine a texture, that 130 hanks, each being 830 yards in length, make but a pound weight. Numerous manufactures of copper, iron, lead, tin-plates, &c. have also been recently set up in various towns both in North and South Wales. *Commerce* may justly be considered at present in its infancy, being chiefly confined to the coasting trade. Except Caernarvon and Swansea, which have lately extended their views to Spain, Portugal, and the West Indies, few of the Welsh ports possess vessels of very considerable tonnage; though no part of the island contains a greater proportion of harbours and roads, some of which are safe and good, and more might soon be made so, by the building of piers and other improvements, which are obvious at the respective places.

Peculiar Customs, Superstitions, &c.—Among a variety of Welsh customs, those in courtship, marriage, and at funerals, excite particular attention. Hymeneal negociations are frequently carried on by the Welsh peasantry in bed: the young swain goes sometimes several miles to visit the object of his choice at her residence; the lovers retire to a bed-chamber, and between the blankets converse on those subjects which the occasion suggests. This usage is confined to the labouring classes of the community; and is scarcely ever productive of those improprieties which might naturally be expected. Previous to the celebration of a wedding, a friend undertakes the office of a bidder; who goes round the neighbourhood to invite all persons of nearly the same situation of life as the contracting parties: in consequence, the friends and neighbours for a great extent make a point of attending the wedding, laden with presents of money, butter, cheese, and other provisions; these are carefully recorded by the clerk of the wedding, opposite to each respective name, and are to be repaid in the same public manner, on similar occasions, whenever demanded. This custom is called *pwrs a gwregys*; and making the presents is termed paying *pwyddion*. As an ancient usage, it is considered as recoverable by law; but a sense of the reciprocal duty generally prevents litigation. Funerals in Wales are attended by greater crowds of people than even their weddings. When the procession sets out, every person kneels, and the minister repeats the Lord's prayer. At every cross-way, the same ceremony is repeated, till they arrive at the church; the intervals of time being filled up by singing psalms and hymns. A remarkable custom prevails, in some parts of Wales, of planting the graves of departed friends with various evergreens and flowers. Box-thrift, and other plants fit for edging, are planted round in the shape of the grave for a border, and the flowers are placed within, so that the taste of the living may be known by the manner of embellishing these mansions of the dead. The snow-drop, violet, and primrose, denote the infant dust; the rocket, rose, and woodbine, shew maturer years; while tansey, rue, and star-wort, mark declining life. Each has its little evergreen, fond emblem of that perennial state where change is known no more. It has been observed, that mountainous scenery is peculiarly friendly to those aerial and imaginary existences which constitute the objects of superstition. This is exemplified in Wales. The belief of witchcraft is still strong, and many are the fatal effects supposed to be produced by supernatural agents: at every house may be seen a horse-shoe, a cross, or some charm of defence. Many old women, on account of their age, and perhaps deformity, bear the odium of preventing the cows from yielding milk, and of inflicting disorders on men and cattle. The supposed witches find it their interest to deny nothing that is alleged to them; and thus become held in superstitious fear by the people, and obtain a livelihood from their imagined extent of power. The belief of those elvine beings called fairies appears to have been ancient and general, and is not yet wholly eradicated. In some degree connected with fairies, is another species of supposed aerial beings, called knockers: these, the Welsh miners say, are not to be seen, but are heard under ground, in or near mines, and by their noises, which represent the different stages in the progress of mining, generally point out to the workmen a rich vein of ore. An opinion is prevalent within the diocese of St. David's, that previous to the death of a person, a light is sometimes seen to proceed from the house, and pursue its

way to the church, precisely in the track that the funeral will afterwards follow. This is traditionally attributed to the special prayer of St. David, that no one in his diocese should die without this intimation of departure, which is called *Canwyll corph*, or the corpse candle.

Language, &c. — The Welsh language has an undeniable claim to very high antiquity, as a dialect of the Hebrew, spoken by the descendants of Japhet: in its formation, as well as grammatical construction, it has a near resemblance to the original tongue; and is, perhaps, without exception, the most primitive and uncorrupt living language in the western world. It abounds with original words, more especially technical terms, which other languages borrow from the Greek, or express by circumlocution, and is said to be peculiarly fitted for poetry. The orthoepy of the Welsh is very different from that of the English. In the language of Cambria are forty-three letters; fifteen of which are radicals, expressive of the primary sounds; and the rest may be considered as serviles, because used as inflexions or mutations of the former; for each of these there is an appropriate character. But the language is gradually getting into disuse, especially in the southern part of the principality. The gentry of the country are principally educated in England, and consequently few of them speak it, and many wish for its extermination. The example of the higher classes extends, and ere long the language and manners of Cambria may coalesce with those of the inhabitants to the east of the Severn. See grammar attached to Owen's Dictionary of the Welsh Language, which contains an ample critical dissertation, &c. 2 vols. 4to. 1803.

Poetry was in high estimation among the ancient Britons: Wales, as their place of refuge, was early the seat of the poetic muse, and modern effusions of original genius evince that she has not deserted her favourite mountains. In no nation, except the Hebrew, was genealogy considered of so much importance, or carried to an equal extent, as in Wales. Family distinction is pursued so far, that perhaps it induces the Cambrian to think more highly of himself than is rational. Pride of ancestry was a delicate and essential point among the ancient Britons, and consequently they were more desirous of noble than of rich connections. So deeply was this principle rooted, that even the lowest classes of the people carefully preserved the descents of their families, and were in general able from memory not only to recite the names of their proximate progenitors, but to trace their various relations back through numerous generations.

Whoever reads the history of the most ancient inhabitants of this island, the Cambro Britons, will find innumerable instances of the reverence which they paid to their poet-musicians, the bards, both of Pagan and Christian times; and songs of very high antiquity have been preserved in the Welsh language, though not all the tunes to which they were sung. The harp, with which these songs used to be accompanied, was in such general favour in Wales, as to be regarded among the possessions necessary to constitute a gentleman. (Leges Wallicæ.) The most ancient Welsh poetry that is now intelligible was written about the year 1100, and some of the tunes that are preserved in the late Mr. Morris's MS., which were transcribed from the music-book of William Penllin, the harper in queen Elizabeth's time, are supposed by Dr. Davies (In Præf. ad Gram. Brit.) to be coeval with the verses to which they were sung, when he composed his grammar and catalogue of ancient Cambro-British songs. Unluckily the notation, or tablature, in which these tunes have been written, is so uncommon and difficult to reduce to modern characters, that though the gravity or acuteness of the several notes can be ascertained, yet their lengths, or duration, cannot be established with any degree of certainty, by any rule which we have been yet able to devise.

The northern annals abound with pompous accounts of the honours conferred on music by princes who were themselves proficients in the art, and the Cambro-British institutes, with laws and privileges in favour of its professors. As the first musician, or bard, was the eighth officer in dignity, at the court of the Welsh kings, and had a place in the royal hall next to the steward of the houshold, so the respect and dignity with which bards in general were treated about this time, in all the courts of Europe, were equal to those which Homer tells us their predecessors Demodocus and Phemius enjoyed in Greece. Music was now a regal accomplishment, as we find by all the ancient metrical romances and heroic narrations in the new-formed languages of the times; and to sing to the harp was necessary to a *perfect prince* and *complete hero*.

The first Greek musicians were gods; the second heroes; the third bards; the fourth beggars! During the early times of music, in every country, the wonder and affections of the people have been gained by *surprize*; but when musicians became numerous, and the art was regarded of easier acquirement, they lost their favour, and from being seated at the tables of kings, and helped to the first cut, they were reduced to the most abject state, and ranked among rogues and vagabonds.

For more particular accounts of different parts of Wales, the reader is referred to the names of the twelve counties: *viz.* ANGLESEA, BRECKNOCKSHIRE, CAERNARVONSHIRE, CAERMARTHENSHIRE, CARDIGANSHIRE, DENBIGHSHIRE, FLINTSHIRE, GLAMORGANSHIRE, MERIONETHSHIRE, MONTGOMERYSHIRE, PEMBROKESHIRE, and RADNORSHIRE. —Hoare's Giraldus Cambrensis, 2 vols. 4to. 1806. Beauties of England and Wales, vol. xvii., North Wales, by Rev. J. Evans, 1812. Ditto, vol. xviii., by Rev. T. Rees, 1815. Warrington's History of Wales, 2 vols. 8vo. 1788. Malkin's Scenery and Antiquities of South Wales, 2 vols. 8vo. 1807. Aikin's Journal of a Tour through North Wales, 12mo. 1797. Evans's Tour through North Wales, 8vo. 1802. Ditto through South Wales, 8vo. 1804.

WALES, a town of America, in the district of Maine, and county of Lincoln, containing 471 inhabitants; 55 miles N.E. of Portland.

WALES, *New*, a name given to a part of North America, situated to the south-east and south-west of Hudson's bay, and divided into north and south: the former name is lost in the more general term of Labrador. New South Wales is situated to the north-west of Canada, and extends along the south borders of Hudson's bay 450 miles, from N. lat. 54° to 58°. W. long. 85° to 95°.

WALES, *New South*, a name given to the eastern part of *New* HOLLAND; which see.

WALES, in a *Ship*, an assemblage of strong planks extending along a ship's side, throughout her whole length, at different heights, and serving to reinforce the decks, and form the curves by which the vessel appears light and graceful on the water. As the wales are framed of planks broader and thicker than the rest, they resemble ranges of hoops encircling the sides and bows. They are usually distinguished into the main-wale, and the channel-wale. The situation of the wales, being ascertained by no invariable rule, is generally submitted to the fancy and judgment of the builder. The position of the gun-ports and scuppers ought, however, to be particularly considered on this occasion,

fion, that the wales may not be wounded by too many breaches. Falconer.

Thofe ftrakes of thick ftuff that are wrought on the outfide of the fhip upon the main-breadth, or broadeft part of the body, are called the *main-wales*. Thofe that are wrought between the ports, which are the *channel-wales* in two-deck fhips, and the *channel-wales* and *middle* or *fheer-wales* in three-deck fhips. See SHIP-*Building*.

WALET, in *Geography*, a city of Africa, and capital of Beeroo, or Biroo; 250 miles W. of Tombuctou. N. lat. 15° 45′. W. long. 2° 45′.

WALGOM, a town of the ifland of Ceylon; 10 miles N.W. of Candi.

WALGRUND, an ifland in the gulf of Bothnia, and one of the clufter called the Quarken Iflands, about ten miles long, but of unequal breadth, in fome places three miles, in others not half a mile. The figure is very irregular. N. lat. 63° 13′. E. long. 20° 58′.

WALHAUSEN, a town of Saxony, in Thuringia; formerly an imperial palatine town; 3 miles W.S.W. of Sangerhaufen.—Alfo, a town of Switzerland, in the canton of Lucerne; 10 miles W. of Lucerne.

WALHEIM, a town of France, in the department of the Sambre and Meufe; 4 miles N. of Gemblours.

WALHOF, a town of the duchy of Courland; 34 miles E. of Mittaw.

WALHORN, a town of France, in the department of the Ourthe; 9 miles S. of Aix-la-Chapelle.

WALI, or WALLA, the title of an officer of the police in various parts of the Ottoman empire; who is the deputy of the pacha, and patroles night and day, keeping a watchful eye on the feditious, apprehending robbers, and, like the pacha, judging and condemning without appeal. This officer has a multitude of fpies, moft of whom are thieves, and by their means knows every thing that paffes. It is not, therefore, aftonifhing, fays Volney, that cities like Cairo, Aleppo, and Damafcus, fhould be fafer than Genoa, Rome, or Naples; but how dearly is this fafety purchafed! and how many innocent lives are facrificed to the partiality and injuftice of the wali and his agents! The wali likewife prefides over the police of the markets, infpecting the weights and meafures, and punifhing delinquents with extreme feverity. For the fmalleft deficiency in the weight of bread, meat, dates, or confectionary, he inflicts 500 ftrokes of the baftinado, and fometimes even death. However, the office of wali does not comprehend various objects of utility that ought to be under the regulation of the police, fuch as the cleanlinefs of the ftreets, and the falubrity of the cities. They are never paved, fwept, or watered, neither in Syria, nor in Egypt.

WALILABO, in *Geography*, a river of the ifland of St. Vincent, which runs into the fea, one mile north from Prince's bay.

WALINCOURT, a town of France, in the department of the north; 6 miles S.S.E. of Cambray.

WALINGHURU, in *Botany*, a name by which fome authors have called the plant, of which the medicinal zerumbeth is the root.

WALK, in *Gardening*, a dry firm track in the garden or pleafure-ground, which is formed of different forts of materials, as gravel, fand, &c.; but where thefe cannot be procured, it is fometimes laid with powdered coal, fea-coal afhes, and powdered brick: thefe are, however, rarely ufed, when either gravel or fand can be procured. Where fea-coal afhes can be had they are preferable to powdered coal or bricks, as they bind very hard, and never ftick to the feet in frofty weather. And for wildernefs-walks they are better than moft other fubftances. There are likewife walks fometimes formed of turf, or what are called grafs-walks.

In forming the firft fort of walks, when they have been marked out, the earth fhould be taken away to a certain depth, that the bottoms may be filled with lime-rubbifh, coarfe gravel, flint-ftones, or other rocky materials, to prevent weeds from growing through the gravel, as well as to keep away worm-cafts. It fhould be laid ten inches or a foot thick, over which the coat of gravel fhould be fix or eight inches, which fhould be very fine, but not fcreened, the large ftones only being taken out. When the gravel has been laid to this thicknefs, they muft be exactly levelled, and raked true from all great drips, as well as little holes; by this means, moft of the ftones will be raked under the feet, which may either be evenly fprinkled back over the laft length that is raked, or buried in the bottom. Walks are frequently laid too round, fo as fcarcely to be walked upon with pleafure, and fo as to leffen the effect of their breadths. The ufual allowance for a gravel-walk of five feet breadth, is about an inch rife in the crown: confequently, if twenty feet wide, it will be four inches higher in the middle than on each fide; and for twenty-five feet, five inches; for thirty feet, fix inches; and fo on in the fame proportion. When the walk has been carefully laid, trodden down, and raked, either in lengths, or the whole together, it fhould be rolled well, both in length and crofsways; the perfon who rolls wearing fhoes with flat heels, that he may not make holes; as, when thefe are once made in a new walk, they are not eafy to roll out again. In order to lay them firm, it will be neceffary to give them three or four rollings, after good waterings or heavy rains, as this will caufe the gravel to bind, fo that when they become dry they will be as hard as terrace. Iron-mould gravel is faid to be the beft for binding, or fuch as has a little binding loam amongft it; which latter, though it be apt to ftick to the heels of fhoes in wet weather, binds better than any thing elfe in dry weather; and when the gravel is over-fandy or fharp, clay is frequently mixed with it, which, when caft together in heaps and well mixed, binds like a rock: loofe gravel is very uncomfortable and uneafy to walk on.

Walks of this fort are not only neceffary near the houfe, but one fhould always be carried quite round the garden, as being foon dry after rain, and proper for walking on in all feafons and times.

Thofe about the houfe fhould be larger than the others, and laid out according to the particular nature and fituation of the grounds in which they are to be formed.

And the walks laid with fand or other materials, in the other different parts of gardens or pleafure-grounds, fhould be formed in the fame manner, having regard to the nature of the foil, fo as to render them as dry as poffible at all feafons. The breadth in thefe walks fhould be in fome meafure according to the nature of the ground. Where this is fmall, five or fix feet may be fufficient; but in large grounds much wider, as ten or twelve. In modern grounds of this fort, they are moftly laid out in winding or ferpentine directions, according to the nature of the fcites, fo as to have them concealed, and rendered as private as poffible, by the trees and plants on their fides; the turns being contrived in as eafy and natural a way as can be effected. See GARDEN, GRAVEL, &c.

In forming grafs-walks, different methods are had recourfe to; but previous to any of which, it is conftantly neceffary to

to have the ground properly prepared by ſuitable levelling, treading, and raking, as well as other means, in the view of making the ſurfaces perfectly firm and even for the purpoſe. In making walks of ſmall and moderate extents, the common practice is then to have them laid with turf cut from ſome neighbouring waſte-ground, or other place, beating it well down at the time, ſo as to form a cloſe, ſmooth, even ſurface. But where the extents of them are very conſiderable, it is moſtly found more convenient and proper to have the ſward formed by the ſowing of them with proper graſs-ſeeds at ſuitable ſeaſons, in doing which, they ſhould be ſown in rather a thick and regular manner, and the ſeed be raked into the earth in an even way, the ſurfaces being afterwards, when quite dry, rolled regularly with a moderately heavy roller, in order to render their upper parts level, and to cloſe the earth or mould well over the ſeeds. See TURFING.

The walks of pleaſure-grounds and gardens have a relation to utility as well as ornament. In the former, they are for the moſt part more ſpacious and extenſive than the neceſſary ones in thoſe of the common latter kinds, being uſually made in conformity with the other decorative compartments, ſo as to form and conſtitute variety in the compoſition of the general plan and deſign, and for connecting with them, and the pleaſure of walking through them, to enjoy the view and beauty of their differently varied arrangements, and the diverſified growths of their reſpective plants, trees, ſhrubs, flowers, and fruits, as well as any thing elſe that may be curious.

In the latter, or gardens, they are neceſſary as forming the communication between the different parts, and for dividing the ground into ſuitable portions, as may be needful in any ſort of culture, as well as for the purpoſe of occaſional walking on for pleaſure, and by way of ornament.

In general, all thoſe walks of the garden, whether of the kitchen or other kinds, may be ſaid to be uſeful, which are required for the ſeparation of the ground into quarters, beds, and borders, as well as other ſimilar parts; and which ſerve to connect and lead to the different parts, or from one to another croſs-wiſe; and which extend round them at the diſtance of a proper border from the boundary fence. And where kitchen-gardens and pleaſure-grounds are connected, the principal walks ſhould be of a more capacious nature, having handſome borders on the ſides, ſuch borders being deſtined for ſmall eſculent plants, as well as thoſe of the flower and ornamental kind.

Walks which are very much wheeled and wrought upon in kitchen-gardens ſhould always be made of ſuch firm ſolid materials as the above; but where they cannot be had, good road-ſtuff, that is, the ſcrapings of them, may be employed. Graſs-walks are never to be had recourſe to in theſe caſes.

The walks in the principal diviſions, or more conſpicuous parts of pleaſure-grounds, ſhould in general be of larger dimenſions, and more elegantly formed, than thoſe of the ordinary kitchen-garden, thoſe near the reſidence being often of very conſiderable width, as already noticed. They ſhould moſtly be laid with ſome of the above ſorts of hard materials, though, in ſome caſes, large turf-walks are in uſe in particular parts.

The walks in pleaſure-grounds are uſually varied as much as poſſible, running in winding irregular directions, and occaſional varying ſtraight lines, as may be moſt ſuitable to the nature, plan, and quality of the grounds; and the ſame is the caſe in large gardens; but in thoſe of the ſmaller ſort, they are commonly made in ſomewhat ſtraight and croſs directions. In moſt large pleaſure-grounds a large walk is run ſomewhat parallel to the main reſidence, extending to the interior of them and the gardens and other parts, having other walks connecting with it, with ſhrubberies, clumps, and flower-borders; but in ſome others, the chief walks go off to the right and left towards the ſides, leaving the middle parts in lawns with ſhrubberies, flower-borders, and plantations of other kinds, or lead to ſome ſide plantation of a ſhady nature, as private walks, or are carried forward in an eaſy, winding, natural manner through the whole extent of the grounds and plantations in different turnings to other more extenſive grounds of the nature of parks, &c. at a greater diſtance; there being other ſimilar ſmaller walks within the confines of the pleaſure-grounds, branching off and diverging in a varied irregular manner to other internal parts of the ſhady kind, as thoſe of groves, thickets, and ſhrubberies, as well as to thoſe of the more open and airy ſort, as large graſs diviſions, detached planted clumps, and other kinds, in various bendings for the purpoſe of exhibiting various views of the different ſhrubby compartments, trees, plantations, flower-borders, graſs lawns, plots of water, and other curious and intereſting rural ornaments. However, on the whole, the beſt and moſt modern modes of laying out the walks of pleaſure-grounds and gardens, are thoſe which moſt perfectly accord with the nature and ſituations of them, and which are the moſt remote from any ſort of regularity and formality in their deſigns.

In ornamented grounds, Mr. London thinks, that walks have partly one of the effects of buildings, which is that of giving force and ſpirit to the ſcenes of verdure and cultivation. Their directions, it is ſuppoſed, ſhould be dictated by their propriety and convenience, and their width by the utility of them. In reſpect to their ornamental effects, they chiefly depend upon their margins, their ſurfaces, and the colour of the materials from which they are formed. In avowedly artificial ſituations, the firſt ſhould be parallel to each other, and properly limited; but where the contrary is the caſe, they ſhould be irregular in their directions as well as compoſitions, as in natural pleaſure-grounds, paſture-fields, parks, foreſts, dingles, &c. In looſe ſcattered buſhy lawns with trees, the ſweeps and turns of the walks ſhould, in a comparative degree, be abrupt, the breadths being varied to a great extent, groups of ſhrubs, or ſingle trees, frequently dividing them, and reducing their widths to narrow courſes which are nearly in the ſame direction, by which they ſhortly unite again in the ſame track, and aſſume their former breadths. Woody banks and commons, it is ſaid, abound with walks of this nature. In thickets and woods, whether of natural trees and undergrowths, or of exotics, as in complete ſhrubberies, the edges of the walks or paths ſhould be wholly annihilated on both ſides, and be bounded only by the irregularity of the loweſt growths. Many places, as thoſe of Foxly and Dunglaſs, afford beauties in full illuſtration, it is ſuppoſed, of the propriety of theſe principles.

In ſhort, the formal, ſtiff, harſh edges of made walks, it is thought, conſtitute one of the moſt ſtriking deformities in rural works of this kind.

In caſes where graſs-walks are intended, they ſhould commonly be of ſome extent in reſpect to width, as narrow trifling ſlips have a bad effect, as already ſeen. In large pleaſure-grounds they ſhould be ſufficiently ſpacious to ſuit their different extents; and in thoſe of the ſmaller kinds, as well as in gardens, they ſhould ſeldom have leſs breadths than eight, ten, or twelve feet. Their ſituations and directions may be various, according to the nature and poſitions of the grounds; as ſome near the reſidence for ornament and ſummer-walking upon in dry ſeaſons; others more diſtant,

diſtant, in the internal parts, chiefly for variety. They may be laid out in various irregular directions, ſo as to ſuit the taſte and the nature of the grounds, having broad, irregular borders of flowers, ſloping winding ſhrubberies, and trees or plantations on their ſides, and in other parts.

In regard to the general care and management of walks, thoſe of the gravel, ſand, or other hard kinds of materials, ſhould be conſtantly kept in neat and clean order by occaſional weeding, ſweeping, and cleaning them, and by frequently rolling them well with an iron or ſtone-roller, as once or twice a week during the ſummer months, as their ſurfaces may appear in a looſe and diſordered ſtate, taking the opportunity of doing it, as often as poſſible, after ſhowers of rain. This renders them firm and ſolid, ſettling any inequalities that may be preſent, and brings them into a ſmooth even ſtate of ſurface. They ſhould alſo be occaſionally rolled in dry open weather, during the winter and ſpring months, to keep them in a level regular ſtate.

When the ſurfaces of them become foul, moſſy, or full of weeds, the gravel or other materials ſhould be turned, which is beſt done in the early ſpring, by means of digging them up to a ſlight depth, and placing the former ſurface part downwards, by which the freſh bottom gravel will become the top, and then treading, raking, and rolling the whole well down again, by which means a new clean ſurface for the enſuing ſpring and ſummer ſeaſons is obtained without any great trouble or expence.

The different graſs-walks ſhould have the ſward conſtantly kept cloſe and clean by frequent mowing, ſweeping, and rolling, during the ſpring and ſummer months; and in the winter time by occaſional poling and rolling when the weather is open and dry, the former ſcattering the worm-caſt earth about, while the latter, which is commonly of the wooden kind, cleans up the diſperſed earth by its adhering to it, and thereby not only renders the ſurface free from dirt, but the whole ſurface cloſe, firm, and even, whereby it becomes capable of being mown with eaſe and facility.

The walks of pleaſure-grounds, gardens, and other ſuch places, ſhould never be ſuffered to have leaves, weeds, or any ſort of rubbiſh, remaining upon them for any length of time, as they ſoon become injured and ſpoiled by them.

Where ſeats are had recourſe to in the walks of ſuch grounds, they ſhould be introduced and managed with conſiderable judgment, taſte, and nicety, ſo as to ſuit the nature of them and the grounds, and be at the ſame time as ornamental as poſſible.

Walk, in the *Manege*, is the ſloweſt and leaſt raiſed of all a horſe's goings. The duke of Newcaſtle ſays, that this motion is performed with two legs, diametrically oppoſite in the air, and two upon the ground at the ſame time, in form of a St. Andrew's croſs; but this, in reality, is the motion of a trot; and accordingly all the latter writers agree, that this author is miſtaken, and that the walk is performed, as any one may obſerve, by the horſe's lifting up its two legs on a ſide, the one after the other, beginning with the hind leg firſt. Thus, if he leads with the legs of the right ſide, then the firſt foot he lifts is the far hind-foot, and in the time he is ſetting it down (which in a ſtep is always ſhort of the tread of his fore-foot on the ſame ſide) he lifts his far fore-foot, and ſets it down before his near fore-foot. Again, juſt as he is ſetting down his far fore-foot, he lifts up his near hind-foot, and ſets it down again juſt ſhort of his near fore-foot, and juſt as he is ſetting it down, he lifts his near fore-foot, and ſets it down beyond his far fore-foot.

This is the true motion of a horſe's legs in a walk; and this is the pace in which many things are beſt taught. For inſtance, when the horſe is to be taught to turn to the right and left, or from one hand to another, he is firſt to be taught it on the walk, then on the trot, and finally on the gallop.

The walk is a pace to which team, carriage, and road horſes, ſhould conſtantly be well broke, as being of great uſe in all ſuch caſes and intentions. It is an excellent pace, too, in a ſaddle-horſe, when well performed by being properly taught.

Walk, *Ring*, among *Hunters*. See Ring-*Walk*.

Walk, *Terrace*. See Terrace.

Walks, *Sheep*, in *Agriculture*, the high dry lands where ſheep paſture in ſome diſtricts. Theſe walks and paſtures may, it is ſuppoſed, be rendered more ſound and healthy, in ſome caſes, by ſowing parts of them with artificial graſs ſeeds, ſuch as thoſe of rye-graſs, rib-graſs, white clover, or trefoil, and others of the ſame kind, in mixture with thoſe of the natural graſs ſort, and keeping them cloſely fed down in a proper manner. In different inſtances, a number of valuable plants of this nature are found to riſe ſpontaneouſly on the ſoundeſt ſheep-walks, and moſt of them, when deſirable, are capable of being raiſed and produced by ſeed as above. Such plants are ſaid to protect ſheep well againſt the rot or poke, and ſome other diſeaſes, in ſuch walks and paſtures. See Rot and Sheep.

Walk-*Mill*, in *Rural Economy*, a name ſometimes applied to the fulling-mill.

WALKÆPETHIGA, in *Botany*, a name by which ſome authors have called the tree, on which the gum lacca of the ſhops is uſually found.

WALKENRIED, in *Geography*, a town of Germany, in the lordſhip of Klettenberg, with an abbey, founded in the year 1127, by Adelheida, conſort to Volkmar, count of Klettenberg, and counteſs of Lohra. The doctrine of Luther was introduced in the year 1546; at the peace of Weſtphalia, the abbey was aſſigned to the duke of Brunſwick; 8 miles N.W. of Nordhauſen.

WALKENSEE, a town of Bavaria, ſituated by the ſide of a lake of the ſame name; 18 miles S.S.E. of Weilhaim.

WALKER, Robert, in *Biography*, one of the earlieſt of our portrait painters: he was contemporary with Vandyck, and improved himſelf by ſtudying the works of that eminent artiſt. He did not attract much public notice till the time of the Commonwealth, when Cromwell made him his portrait painter, and he drew that extraordinary perſonage ſeveral times. One picture of him by Walker is at Horſeth, the ſeat of lord Mountford in Cambridgeſhire: it was given to his lordſhip by Mr. Commiſſary Greaves, who found it at an inn in that county. Another is at Caſhiobury, the earl of Eſſex's. Another picture of him, with general Lambert, was in lord Bradford's collection. A fourth was purchaſed at the coſt of 500*l.* for the grand duke of Tuſcany. Walker had for ſome time an apartment in Arundel Houſe, and died a little before the Reſtoration. His own picture which is a very fair ſpecimen of his power is in the gallery at Oxford.

Walker, George, F.R.S., a diſſenting divine, and eminent mathematician, was born at Newcaſtle-upon-Tyne, about the year 1734, and completed his education at the univerſity of Edinburgh, under the celebrated mathematician Dr. Matt. Stewart, and at Glaſgow, where he ſtudied theology and ethics. In 1756 he ſettled at Durham as a diſſenting miniſter, and thence removed to Yarmouth, where he remained for ſome years, and was highly eſteemed. During his reſidence at Yarmouth he married;

married; and foon after, in 1772, he undertook the office of mathematical tutor at the academy in Warrington. In this place he publifhed, in 1775, his "Doctrine of the Sphere," a work highly appreciated, not only as a complete treatife on the fubject, but as a model of geometrical demonftration. In the fame year he removed to Nottingham, and became one of the minifters of the high pavement meeting-houfe. Ardently attached to the principles of liberty, and feeling no diffidence or timidity in the declaration of his fentiments, his talents and difpofition concurred to give him influence amongft thofe who affembled for political purpofes; and his characteriftic energy of fpirit and ftyle is difcernible in the addreffes and petitions that iffued from the corporation of the town. Of one of thefe productions Mr. Burke declared, that he had rather have been the author of it than of all his own compofitions. So much was Mr. Walker efteemed for his talents and temper, that thofe who detefted his political principles fought his company and converfation, and both honoured and loved him. His hofpitality and beneficence far exceeded his ability. After a refidence of twenty-four years at Nottingham, he was induced by a variety of circumftances to undertake the office of theological tutor and director of a diffenting academy at Manchefter. For the office of fuperintendant of a public ceremony he was not peculiarly qualified, either by the liberal difpofition of his mind, or the habits of his life; and he foon found this fituation unpleafant to him, more efpecially as he was now advancing in years, and relaxation from conftant labour became effential to his enjoyment. He therefore quitted this connection, and retired to the vicinity of Liverpool. Since he had left Warrington, he had publifhed feveral fingle fermons; two volumes of fermons, characterized by original thought and fervid expreffion; "An Appeal to the People of England," upon the teft-laws, much admired and commended by Mr. Fox; and the firft part of a "Treatife on Conic Sections," referred to with deferved commendation in our article Conic *Sections*. In 1807 Mr. Walker vifited London, in order to publifh two additional volumes of fermons, and two volumes of Philofophical effays; but he was feized with a diforder, which terminated his life at the age of feventy-three, and his remains were interred in Bunhill-fields, on which occafion Dr. Rees delivered, at the vault, an oration, which was printed by his friends, and which contained a brief fketch of his character. "To a ftock of claffical knowledge," fays one of his biographers, "he added an intimate acquaintance with hiftory, ancient and modern, a familiarity with the beft authors of various claffes, a natural and glowing eloquence, and a heart, in which every kind and focial affection occupied a place." Athenæum.

Walker's *Cove*, in *Geography*, a harbour on the weft coaft of North America, in Behm's canal: fo called from Mr. Walker, furgeon of the Chatham. N. lat. 55° 42'. E. long. 229° 20'.

Walker's *Key*, one of the fmall Bahama iflands. N. lat. 26° 50'. W. long. 78° 54'.

WALKERIA, in *Botany*, was fo called by Schreber, in juft commemoration of the founder of the botanic garden at Cambridge, the Rev. Richard Walker, D.D. vice mafter of Trinity-college. To this foundation a lectureſhip is attached, and both together are in the gift of five truftees, unfhackled by any of thofe limitations which ufually tend only to defeat the purpofe of fuch eftablifhments; for Dr. Walker exprefsly orders, by his will, that any perfon, even a foreigner, fhall be eligible to the appointment, and may, if he pleafes, read his lectures in Latin. The prefent worthy profeffor of botany, the Rev. Thomas Martyn, B.D. is the only perfon who has hitherto held the lectureſhip in queftion, of which, as long as his health would permit, he regularly performed the duties. Another *Walkeria*, in honour of the fame liberal patron of botanic fcience, was named by Miller and Ehret; but that genus having accidentally had various previous appellations, is now eftablifhed by the Linnæan one of Nolana, which the reader will find in its proper place.—Schreb. Gen. 150. Willd. Sp. Pl. v. 1. 1145. Mart. Mill. Dict. v. 4. (Meefia; Gærtn. t. 70. Lamarck Illuftr. t. 143.)—Clafs and order, *Pentandria Monogynia*. Nat. Ord. uncertain; akin to Ochna.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five ovate, acute, concave, fpreading, permanent fegments. *Cor.* Petals five, lanceolate, acute, fpreading, rather longer than the calyx. *Stam.* Filaments five, capillary, afcending, half the length of the petals; anthers roundifh. *Pift.* Germen fuperior, globular, five-cleft; ftyle briftle-fhaped, erect, as tall as the ftamens; ftigma fimple. *Peric.* Drupas five, obovate-kidneyfhaped, of one cell. *Seed.* Nut folitary, kidney-fhaped, rather bony.

Eff. Ch. Calyx inferior, in five deep permanent fegments. Corolla of five petals. Drupas five. Nuts folitary, kidney-fhaped.

1. W. *ferrata*. Serrated Walkeria. Willd. n. 1. (Meefia ferrata; Gærtn. v. 1. 344. Tsjocatti; Rheede Hort. Malab. v. 5. 95. t. 48.)—Native of various parts of the Malabar coaft, flowering and bearing fruit at various feafons. We have not heard of this plant in any garden, nor are its dried fpecimens frequent in collections. The *ftem* is fhrubby, about twelve feet high, with round, fmooth, leafy, alternate *branches*. *Leaves* evergreen, fmooth and fhining, alternate, on fhort ftalks, elliptic-lanceolate, acute, more or lefs evidently and acutely ferrated, four or five inches long, furnifhed with a ftrong mid-rib, and many fine, tranfverfe, reticulated veins. *Stipulas* none. *Panicles* terminal, with racemofe, compound, angular, fmooth flower-ftalks. *Flowers* yellowifh, about half an inch in diameter, without fcent. *Fruit* reddifh, fhining, acid and bitter, feated on the dark-red enlarged *calyx*. Some of the *drupas*, in each flower, are often abortive. The qualities of the various parts of this fhrub feem to be of an aftringent and tonic nature.

Gærtner gives, as a fynonym to his *Meefia*, *Walkera*, a Ceylon name, found attached to the feeds in the collection at Leyden, from which he made his figure and defcription. Schreber, in adopting Gærtner's genus, found it neceffary to change his name, Meesia being appropriated to a genus of moffes, which however is now funk in Bryum; fee thofe articles. We prefume he meant to re-eftablifh the old name *Walkeria*, of which, therefore, we retain the proper orthography. It is not to be fuppofed that, in this inftance alone, he would adopt an entirely barbarous appellation; but the coincidence is fingular. Even this appellation indeed proves to be corrupt. We have fought it in vain in Hermann's *Mufeum Zeylanicum*, but we find there *Malkira*, p. 9, whence, no doubt, it originated; for Linnæus has written *Ochna* againft this *Malkira* in his own copy of Hermann's work, the very copy ufed by him in writing his *Flora Zeylanica;* and the defcription of the leaves in p. 93, 94, of the latter book, fhews his *Ochna*, var. α, to be our *Walkeria ferrata*, whatever doubt may attach to Burmann's t. 56.

WALKERS, a fort of foreft-officers, appointed by the king to walk about a certain fpace of ground, committed to their care and infpection.

Walkers are the fame with what we otherwife call forefters.

WALKERSPACH, in *Geography*, a river of Wurtemberg, which runs into the Rems.

WALKERTON, a town of Virginia, on the Mattapony; 30 miles N.E. of Richmond.

WALKING-FIRE. See IGNIS *Fatuus*.

WALKOOG, in *Geography*, a town of Holland; 10 miles N. of Alcmaer.

WALKUFFA, in *Botany*, a tree which grows in the Kolla, or hotteſt part of Abyſſinia. This does not flower immediately after the rains, like the other Abyſſinian trees, that is, between the beginning of September and the Epiphany, but towards the middle of January it appears firſt covered with flowers. Although beautiful, it has no ſmell, and is found to be deſtructive to bees, ſo that it is rooted up in thoſe countries that pay their revenue in honey. In its appearance it reſembles the Engliſh Kentiſh cherry-tree: the wood immediately under the bark is white, but under that a browniſh-yellow, ſomewhat like cedar. Although the wood is heavy, it ſwims in water, contrary to the opinion of the natives. Mr. Bruce has given a botanical deſcription of this tree in the Appendix to his Travels.

WALL, in *Architecture*, &c. a work of ſtone, brick, or the like, making the principal part of a building; as ſerving both to encloſe it, and to ſupport the roof, floors, &c.

Walls, though built very thick and ſtrong, and their foundations laid deep, yet, if carried on ſtraight in a line, are apt to lean, or fall; and ſuch as are built crooked, though thin and weak, are much more laſting. A wall raiſed over a river, on arches of pillars, ſtands as firm as others, whoſe foundation is entire.

Hence, it appears, that a wall built much thinner than uſual, by only having at every twenty-feet diſtance an angle ſet out about two feet, or more, in proportion to the height of the wall; or by having, at the like diſtance, a column, or pilaſter, erected along with it, ſix or eight inches on each ſide, over and above the thickneſs of the reſt of the wall, will be much ſtronger than if five times the quantity of materials were uſed in a ſtraight wall.

Walls are diſtinguiſhed into divers kinds, from the matter of which they conſiſt; as *plaſtered* or *mud-walls*, *brick-walls*, *ſtone-walls*, *flint*, or *boulder-walls*, and *boarder-walls*. In all which theſe general rules are to be regarded:

1. That they be built exactly perpendicular to the groundwork.

2. That the maſſieſt and heavieſt of materials be the loweſt; as being fitter to bear, than be borne.

3. That the walls, as they riſe, diminiſh proportionally in thickneſs, for eaſe both of weight and expence.

4. That certain courſes, or ledges, of more ſtrength than the reſt, be interlaid, like bones, to ſtrengthen the whole fabric.

Mud and plaſtered walls are chiefly uſed in ordinary timber-buildings. Theſe walls, being quartered and lathed between the timber, or ſometimes lathed over all, are plaſtered over again with white mortar.

In the conſtructing of brick-walls, which are the moſt important and uſual of any kind, it is neceſſary to take particular care in laying and managing the materials; that in ſummer they be laid as wet, and in winter as dry as poſſible, in order that they may be made to bind the better with the mortar; that in ſummer, too, they be covered over as faſt as they are laid, in the view of guarding and preventing the mortar and other matters from drying too quickly. That in winter alſo, they be covered well, to protect them from heavy rain, ſnow, and froſt, which are all enemies to, and greatly deſtructive of mortar; that they be laid joint on joint, in the middle of the walls, as ſeldom as may be; ſo that good bond be made there as well as on the outſides. Care is likewiſe to be taken that the angles be firmly bound, as they may be conſidered as the nerves and ſinews of the whole fabric. In order to which, in working up ſuch walls, it is not adviſable to raiſe any of them above eight feet in height, before the the next adjoining ones be brought up to them; ſo that a good bond may be made as the work proceeds. It may be noticed that a wall of this kind, a brick and a half thick, with the joint, will be in breadth fourteen inches, or very near it; and in which one hundred and fifty, or one hundred and ſixty bricks will lay a yard ſquare, meaſured on the face of the wall; and that to the ſquare of ten feet, ſeventeen or eighteen hundred bricks are uſually allowed.

In building a houſe in the city of London, the walls are to be of ſuch thickneſſes as are enjoined by act of parliament. See BUILDING, and PARTY-*walls*.

In the forming of ſtone-walls, the ſame ſort of care and attention is requiſite in protecting and preſerving them from the injurious effects of external cauſes of the above kinds, as well as in that of building them in a ſolid and ſecure manner. The foundations are alſo to be well looked to. The two ſides or faces are to be evenly carried up, and the fillings to be put well and ſufficiently in the middle parts between them, proper long ſtones being occaſionally placed acroſs, to bind the two faces ſecurely together, and prevent their ſeparating. Theſe attentions are equally neceſſary in the ſtone-walls of buildings, as in thoſe of the better ſort of ſtone-walls for other uſes and purpoſes.

In the raiſing of double walls in this way, as defences in fields and grounds, which is ſometimes done, the faces may be bound in, where proper ſtones as throughs cannot be had, by thin layers or ſtrips of the ſtones, laid in mortar, at about every fourteen inches in height, as they riſe, the mortar being in ſuch caſes kept ſoft, ſo as that it may lay firm hold of the ſtones. And with the ſimilar intention of keeping them upright, and preventing their ſeparation, they may be carried up with a conſiderable inclination inward, towards each other, tapering upward as they riſe, in the proportion of about one inch, on each ſide, to every foot or foot and a half of riſe or height.

In raiſing ſingle field-walls, which is not uncommon in ſome high ſituations, and where large ſtones are met with in plenty upon the ſurface of the land, two benefits are attained, in ſome caſes, by running them up in as open a manner as the nature of the materials will permit, ſo as to form good work. Such open-work walls are leſs liable to be thrown down by the winds in ſuch expoſed ſituations, than thoſe of the cloſe kind; which is an inconvenience to which ſingle walls are expoſed in ſuch caſes; as by means of part of the blaſt paſſing through them, its force is conſiderably diminiſhed. And the wild mountain-breeds of ſheep are leſs apt to ſcale walls ſo conſtructed, than they are thoſe which are formed in a cloſer manner, and have a more ſolid appearance. This is particularly the caſe if they be laid with ſmall ſtones looſely on the tops.

It is ſaid that ſtone-walls of the field ſort, which are apt to ſhatter with froſts, if laid only a foot deep in the middle with mortar, or even road-ſtuff made into it, are held well together, and become durable.

Flint, or boulder-walls, are ſaid to be much uſed, in ſome parts of the counties of Suſſex and Kent, for fence-walls in ſurrounding court-yards, gardens, and other ſuch places. In performing the work of building them, a right and left-handed man ſuits well, as they have the hod of mortar poured down upon the work, which they part between them,

them, each ſpreading it towards himſelf, and in this way they lay in the flints; the mortar in this caſe being made very ſtiff. Stone and earth walls are only of a temporary, and not by any means of a complete nature; they may, however, in ſome caſes, ſerve to defend rabbit-warrens and other ſuch places, when ſtones are not wholly to be had for the purpoſe, and they are formed and conſtructed in a proper manner. They are, however, very apt to be thrown down by large animals, and to be ſoon deſtroyed, conſequently to be expenſive in the end.

Turf or ſod walls are in pretty much the ſame ſituation in regard to their uſe, and form but a very indifferent ſort of defence; they are, however, found uſeful on ſome occaſions, where other kinds of materials cannot be met with.

Boarded walls are only had recourſe to in particular caſes, as from their periſhable nature they are conſtantly required to be kept coated over with ſome ſubſtance as a protection at a conſiderable expence. They are formed in ſeveral different ways, according to the nature of the circumſtances, and their intended uſes.

Walls of different kinds, and banks of earth, are ſometimes employed in defending plantations of young trees from the injuries to which they are liable and expoſed in many caſes; and in ſome ſituations they form cheap and eligible modes of effecting the buſineſs.

In ſpeaking of building field-walls, Mr. London has remarked, that when lime is employed in ſuch walls, if, in place of ſlacking it, and letting it lie to mellow or ſour for ſome weeks, no more were flaked and made ready for uſe than what was worked up in the ſame day;—if the ſand were clean and rough, and well incorporated with the lime, and the coping put carefully on, ſuch walls would laſt an inconceivable length of time. Lime uſed in this way, it is ſaid, binds immediately; and that the longer it ſtands the harder it becomes. The ſurfaces of ſuch walls, too, would acquire a coating of moſſes, which, it is thought, would add greatly to their beauty, and at the ſame time prevent decay. Our anceſtors, it is ſaid, uſed lime in this way; and their buildings, in walls of the field kind, as well as in houſes, though under every diſadvantage, remain, it is obſerved, as monuments of their ſuperior knowledge in this particular. But the modern builders in general, it is thought, deſtroy their mortar before they make uſe of it: it is ſaturated, it is ſaid, with fixed air, or, in common language, has *loſt band* before it is put in the walls: hence the weakneſs and ſpeedy decay of modern walls and buildings, eſpecially thoſe of the rubble work kind. A proper notion of the importance of this hint is, it is thought, too ſeldom formed. But let it be aſked, whether it be moſt deſirable to build walls that will ſtand for centuries with little or no repair, or to build them in the common way, when, if they ſtand half a century, they are to be pointed or rough caſted every eight or ten years; while the different modes coſt nearly the ſame in the original expence?

The uſes of ſtone-walls as field defences are limited to particular diſtricts and ſituations, and the nature of their conſtruction and magnitude muſt reſt materially upon the kinds and ſizes of the ſtones which are employed, and the purpoſes for which they are deſigned. In erecting ſuch walls, thoſe of the particular vicinity ſhould be attended to, and the moſt ſuitable forms of them adopted, proper eſtimates of their expence of building being firſt procured. See Fence.

Wall, *Angle of a.* See Angle.

Wall, *Coping of a.* See Coping.

Wall, *Plinth of a.* See Plinth.

Wall, *Scenography of a.* See Scenography.

Walls, *Painting on.* See Painting.

Walls, *Fence.* See Fence, and Land, *Incloſing of.*

Walls, *Party.* See Party.

Wall, *Picts.* See Picts.

Walls, *Roman*, were barriers or defences conſtructed by the Romans for ſecuring the northern frontiers of their Britiſh territories. Where they could not avail themſelves of ſeas, firths, rivers, woods, and mountains, for their protection, they had recourſe to a variety of artificial modes of defence; guarding thoſe parts of their frontiers that were moſt acceſſible by chains of forts, deep ditches, elevated mounds and ramparts of earth, and even ſtone-walls. Agricola, having in the ſecond year of his government, A.D. 79, conducted his army northwards, and reduced the Brigantes, the Ottadini, the Gadeni, and perhaps the Selgovæ, to obedience, obliged them to give hoſtages, and begirt them with garriſons and fortreſſes to ſecure his conqueſt. The forts which he built are ſuppoſed to have been on or near the tract where Adrian's rampart and Severus's wall were afterwards erected. In his third year he proceeded as far N. as the river Tay, and in the following ſummer employed his forces in conſtructing a chain of forts between the firths of Forth and Clyde. The ſpot was wiſely choſen for this purpoſe; and this chain of forts, each of which was garriſoned and furniſhed with proviſions for a year, ſerved to keep the adjacent country in obedience, and reſtrained the incurſions of the Caledonians, while Agricola proſecuted his operations in Britain. But by the negligence of his ſucceſſors, theſe forts became an inſufficient ſecurity after his departure. Although little is known of the occurrences that filled up the interval between the departure of Agricola, A.D. 85, and the arrival of Adrian A.D. 120; yet we have ſufficient reaſon for believing, that the Britiſh nation, in the ſouth of Scotland and in the north of England, had in that interval thrown off the Roman yoke. The emperor Adrian, more intent upon ſecuring than enlarging his empire, contracted its limits in Britain; and for its protection dug a deep ditch, and threw up a lofty and ſpacious rampart from ſea to ſea; and this was the ſecond artificial barrier of the Roman territories in Britain. This rampart was conſtructed of earth, and extended from the Solway firth, a little W. of the village of Burgh on the Sands, in as direct a line as poſſible, to the river Tine on the eaſt, at the place where the town of Newcaſtle now ſtands; ſo that it muſt have been above ſixty Engliſh, and near ſeventy Roman miles in length. This work conſiſted of the principal Agger or Vallum (rampart) on the brink of the ditch; the ditch on the N. ſide of the Vallum; another agger or mound of earth on the S. ſide of the principal vallum or rampart, at about five paces diſtant from it, which may be called the ſouth agger; and a large agger or mound on the N. ſide of the ditch, denominated the north agger. This laſt is ſuppoſed by Horſley to have been the military way to the ancient line of forts, built by Agricola, and alſo ſerving as a military way to this work. The ſouth agger is ſuppoſed to have been made for an inner defence, in caſe the enemy might beat its defenders from any part of the principal rampart, or to protect the ſoldiers againſt a ſudden attack from the Provincial Britons. It is generally ſomewhat ſmaller than the principal rampart, but in ſome places it is larger. Theſe four works preſerve a conſtant paralleliſm one to another. The diſtance of the north agger or mound from the brink of the ditch is about twenty feet. It is conjectured that the principal rampart was at leaſt ten or twelve feet high; the ſouth one not much leſs, but the north one conſiderably lower. The ditch was near nine feet deep, and eleven

eleven feet wide at the top, but ſomewhat narrower at the bottom. Such was the rampart or defence erected by command of the emperor Adrian, A.D. 120, for guarding the Roman territories to the ſouth of it from the incurſions of the Britons on the north. This work was defended by a competent number of Roman ſoldiers and auxiliary troops, who garriſoned the forts and ſtations, which were ſituated at proper diſtances along the line of it. Moſt, if not all, of theſe forts and ſtations had been fixed and conſtructed before by Agricola and others. Adrian's rampart, however, did not long continue to be the extreme boundary of the Roman territories to the north in Britain; for Antoninus Pius, having brought the Mœatæ again under the yoke, commanded another rampart to be erected much farther north, between the firths of Forth and Clyde, in the tract where Agricola had formerly built his chain of forts. From an inſcription on the fragment of a Roman pillar, it is inferred that this work was executed in the third conſulſhip of Antoninus, A.D. 140. This wall or rampart, as ſome imagine, reached from Caer-ridden on the firth of Forth to Old-Kirkpatrick on the Clyde; or, as others think, from Kinniel on the E. to Dunglaſs on the W. Its length appears to have been about 37 Engliſh or 40 Roman miles. Capitolinus ſays, that it was conſtructed of turf; but from remaining veſtiges it is concluded with certainty that the foundation was ſtone. Camden ſays, that the principal rampart was faced with ſquare ſtone, to prevent the earth from falling into the ditch. Its chief parts were as follow:—A broad and deep ditch, ſaid to be twelve feet wide; the principal wall or rampart, about twelve feet thick at the foundation, ſituated on the S. brink of the ditch; a military way on the S. ſide of the principal wall, well paved, and raiſed a little above the level of the ground. This work, as well as that of Adrian, was defended by garriſons placed in forts and ſtations along its line. The number of theſe was eighteen, at the diſtance of two miles from each other. In the intervals between the forts, there were turrets or watch-towers. After the lapſe of more than 1600 years, we are enabled to aſcertain by what particular bodies of Roman troops almoſt every part of it was executed. This diſcovery is made by means of inſcriptions upon ſtones, originally fixed in the face of the wall, and found near its ruins. The number of ſtones with inſcriptions now extant is eleven; and from theſe it appears in general, that this great work was executed by the ſecond legion, the vexillations of the ſixth legion and of the twentieth legion, and one cohort of auxiliaries. If theſe corps were all complete, they would compoſe a body of 7800 men. This wall was not long the boundary of the Roman territories in Britain; for we are told, by an author of undoubted credit (Dio), that, in the reign of Commodus, A.D. 180, he had wars with ſeveral foreign nations, but none ſo dangerous as that of Britain; for the people of that iſland, having paſſed the wall which divided them from the Romans, attacked them and cut them to pieces. We alſo know, that the country between the walls of Adrian and Antoninus continued to be a ſcene of perpetual war and ſubject of contention, between the Romans and Britons, from the beginning of the reign of Commodus to the arrival of the emperor Septimius Severus in Britain, A.D. 206. This laſt emperor, having ſubdued the Mœatæ, and repulſed the Caledonians, determined to erect a ſtronger and more impenetrable barrier than any of the former, againſt their future incurſions. This laſt wall, the greateſt of all the Roman works in Britain, was begun A.D. 209, and finiſhed A.D. 210.

It was built nearly on the ſame tract with that of the rampart of Adrian, at the diſtance only of a few paces north. Its length, from Couſins-houſe near the mouth of the river Tine on the eaſt to Boulneſs on the Solway firth on the weſt, was a little more than 68 Engliſh miles, and a little leſs than 74 Roman miles. To the north of the wall was a broad and deep ditch, ſuppoſed to have been larger than that of Adrian. The wall itſelf, ſtanding on the brink of the ditch, was built of ſolid ſtone, ſtrongly cemented with the beſt mortar; the ſtones which formed both the faces being ſquare aſhlers, and the filling ſtones large flags, ſet a little ſlanting. The height of this wall was twelve feet beſides the parapet, and its breadth eight feet, according to Bede, who lived near the W. end of it, and in whoſe time it was almoſt entire in many places. Conſidering the length, breadth, height, and ſolidity of this wall of Severus, it was without doubt a work of prodigious labour and extraordinary magnificence. But the wall itſelf was only a part, and not the moſt diſtinguiſhing part of this work. The great number and different kinds of fortreſſes which were built along the line of it for its defence, and the military ways that pertained to it, are much more worthy of admiration; for an account of which ſee STATIONS. The caſtella, or caſtles, were the ſecond kind of fortifications, which were built along the line of this wall for its defence. They were neither ſo large nor ſo ſtrong as the ſtations, but much more numerous, being no fewer than eighty-one. They were exact ſquares of ſixty-ſix feet every way; fortified on every ſide with thick and lofty walls, but without any ditch, except on the N. ſide, on which the wall itſelf, raiſed much above its uſual height, with the ditch attending it, formed the fortification. The caſtles were ſituated in the intervals between the ſtations, at the diſtance of about ſeven furlongs from each other. In theſe caſtles, guards were conſtantly kept by a competent number of men detached from the neareſt ſtations. The towers, or turrets, were much ſmaller than the caſtles, forming a ſquare of about twelve feet, and ſtanding out of the wall on its S. ſide. (See TURRETS.) The uſual complement of troops allotted to the defence of this, conſiſted of twelve cohorts of foot, each cohort including 600 men, one cohort of mariners in the ſtation at Boulneſs, one detachment of Moors, probably equal to a cohort, and four alæ or wings of horſe, conſiſting at the loweſt computation of 400 each; the whole number being 10,000. For the convenience of their march from one part of the wall to another, to the wall were annexed two military ways, paved with ſquare ſtones, in the moſt ſolid and beautiful manner, one larger, and one ſmaller: the latter ran cloſe along the S. ſide of the wall, from turret to turret, and caſtle to caſtle, for the uſe of the ſoldiers in relieving their guards and ſentinels, and ſuch ſervices; the larger way was not ſo near the wall, nor did it touch at the turrets or caſtles, but purſued the moſt direct courſe from one ſtation to another, and was deſigned for the convenience of marching large bodies of troops. This wall of Severus proved an impenetrable barrier to the Roman territories for near 200 years. But about the beginning of the fifth century, the Mœatæ and Caledonians, now called Scots and Picts, took advantage of the withdrawment of many of the Roman forces from Britain, and broke through the wall, while others ſailed round the ends, carrying their ravages into the very heart of Provincial Britain. Theſe invaders were often repulſed by Roman legions ſent to the relief of the Britons; and the laſt of theſe legions, under the command of Gallio of Ravenna, aſſiſted by the Britons, regained the walls and its fortreſſes, and then took their laſt farewell of Britain. The Scots and Picts found little reſiſtance in breaking through the wall, whoſe towers and caſtles were tamely abandoned to their deſtructive rage. In many places they

they levelled it with the ground; and in subsequent times it was so far disregarded, that it became the common quarry for more than 1000 years, and of which all the towns and villages around were built; and it is now so entirely ruined, that the most patient and penetrating antiquarian can hardly trace its vanishing foundations. Henry's History, vol. ii. See PICTS *Wall*, and SCOTLAND.

WALLS, *Sea*. See DIKE.

WALL, in *Fortification*. See RAMPART.

WALL, in *Gardening*, a sort of fence erection in gardens, composed of hard materials, built for the purpose of ripening all such fruits as are too delicate to be perfected in this climate, without such assistance. Walls are raised with different kinds of materials, as stone, brick, earth, or mud, &c. according as they can be best procured, and at the cheapest rate. But for fruit-trees, brick is the best, as being not only the handsomest, but the warmest and kindest for the ripening of fruit, as well as affording the best convenience of nailing; for smaller nails will serve in them than in stone-walls, where the joints are larger; and brick-walls, with copings of free-stone, and stone pilasters or columns at proper distances, to separate the trees, and break off the force of the winds, make not only the most beautiful but the most profitable walls that can be erected.

Rammed earth-walls, as well as those formed of muddy clay, answer very well in some intentions, being very close, compact, and warm.

Sometimes walls are built of mixed materials, as stones and bricks; but in this way they should be carefully built, or the brick front will separate from the stone behind.

Where walls are built entirely of stone, there should be trellises fixed up against them, for the more convenient fastening the branches of the trees: the timber of these espaliers need not, however, be more than an inch and a half thick, and about two inches and a half broad. These should be fixed across each other, at about four inches distance; for if they are at a much greater distance, it will be difficult to fasten the shoots of the trees properly. As this trellis will be laid close to the wall, the branches of the trees will lie about two inches from the wall; in which position the fruit ripens better than when it lies quite close to the wall.

Many improvements have been attempted in building walls in different forms, as in semicircular methods, in angles of various forms, and projecting more towards the north, to screen off the cold winds; but not any method has yet been found which succeeds so well as that of making them straight, and building them in an upright manner. Something of the long-oval from east to west might probably be beneficial in the production of fruit, as there would be the smallest space of it hid from the influence of the sun at any one time.

Many other schemes of expediting the ripening of fruits on walls have been tried, such as painting them black, or of a dark colour, as the dark colour is supposed to imbibe more of the sun's rays, and retain the warmth longer. This has, however, on the same principle, answered better in theory than practice.

Walls, where substantially built, answer much better than those which are slight, not only in their duration, but also in their warmth. A wall two bricks thick will be found to answer better than one brick and a half; and if, in the building of garden-walls, they are grouted with soft mortar, to fill and close all the joints, the walls will be much stronger, and the air not so easily penetrate through them, as it does through those which are built in the usual manner.

In respect to the aspect for walls in this climate, those which have one point to the eastward of the south are the best, as they enjoy the benefit of the morning sun more, and are less exposed to the west and south-west winds, which are very injurious to fruits, than those which are built due south: and the next best aspect is due south, and after that the south-east. But as there will, for the most part, be south-west and west walls, these may be planted with some sorts of fruit which do not require so much heat to ripen them as those designed for the best walls: but wherever there are north walls, those will only be proper for baking pears, plums, and morello cherries, for preserving; or duke cherries may be planted against these walls, to continue them longer in the season.

The usual thickness of building walls with brick is thirteen inches, or a brick and a half; but this should be proportionable to the height: for if they are built twelve or fourteen feet high, or more, as is often practised, then the foundations of the walls should be at least two bricks and a half in thickness, and brought up a foot or more above the level of the surface of the ground, of the same thickness; then be set off two inches on each side, which reduces them to two bricks; and five or six feet above the surface of the ground, they may be diminished on each side, to reduce them to the thickness of a brick and a half, which must be continued to the top. The piers in these high walls should also be proportionably stronger than is commonly allowed to lower walls; for, as being more exposed to strong gales of wind, if they are not well built, they are in danger of being blown down. The piers in these cases should be projected the length of a brick in the back side, and the thickness of a brick in the front, and be built about ten or twelve feet asunder. There is, however, no necessity for building walls higher than nine or ten feet, unless for pears. Mr. London, however, thinks that garden-walls should seldom be made lower than twelve or thirteen feet, and that they never need be higher than sixteen, except where they are connected with buildings of the hot-house kind.

In building of hot-walls, the ordinary height is usually about ten feet, which is sufficient for any of those sorts of fruits that are generally forced; for by forcing the trees, they are mostly weakened in their growth, so that they do not grow so vigorously as those which are exposed to the open air; and where there is not a quantity of walling planted sufficient to let one part rest every other year, the trees are never very healthy, and last but a few years. In these walls the foundations should be made four bricks and a half thick, in order to support the flues; otherwise, if part of them rest on brick-work, and the other part on the ground, they will settle unequally, and soon be out of order; for wherever there happens any crack in the flues, through which the smoke can make its escape, it will prevent their drawing; and if the smoke gets within the glasses, it will greatly injure the fruit, and give it a smoky taste. This thickness of wall need not be continued more than six inches above the ground, where the foundation or the bottom of the first flue should be, which will be sufficient to raise it above the damps of the earth: then the wall may be set off four inches on each side, which will reduce it to the thickness of three bricks and a half, so that the back wall may be two bricks thick, which is absolutely necessary to throw the heat out more in front; for when the back walls are built too thin, the heat escapes through them. The wall in front next to the fruit should be only four inches thick, whereby there will be an allowance of nine inches for the flues, which may be covered with twelve-inch tiles; for if they have an inch and a half bearing on each side, it will be sufficient. The places in which the fires are made must be contrived on the

the back side of the walls, which should be in number proportionable to the length of the walls. The length usually allowed for each fire to warm is forty feet, though they do very well for fifty feet: they should be shedded over with brick and tile, to keep out the wind and rain, otherwise the fires will not burn equally; and as it is quite necessary to have the fire-places or ovens below the foundation of the first flues, there must be steps down into the sheds, to come to the mouth of them to supply the fuel: of course, they should not be narrower than eight feet in the clear. Where the length of walling requires two ovens, they may be in the middle, being included in one shed, which will save expence, and allow more room to attend the fires; as, in this case, the sheds must be at least ten feet long, but not more than six in breadth, the steps down being at one end.

In regard to the lower flue, through which the smoke first passes from the fire, it may be two feet and a half deep: of course, the back wall should be at least two bricks and a half thick, as high as the top of this flue; and then it may be set off to two bricks, which must be continued to the top of the wall. The second flue, which should return over the first, may be made two feet; the third, a foot and a half; and the fourth, one foot deep; which four flues, with their coverings, will rise near eight feet in height, so that there will be about two feet left for fixing of the frames at the top to support the glasses, and for the coping of the wall: these four returns will be sufficient to warm the air in the frames. But in the carrying up these walls, some strong iron hooks should be well fastened at convenient distances, projecting about two inches from the wall, to which the trellis must be fastened, which is to support the trees. The flues must be well pargeted with loam on their inside, and loam be spread under the tiles which cover them, to the thickness of the hooks, that the flues may be very smooth. At each end of these flues small arches should be turned in the back walls, in such a manner that there may be holes opening to clean the flues of soot, whenever there is a necessity for it. With respect to the borders in the front of these walls, they should be about four feet wide, which will make a sufficient declivity for the sloping glasses; and on the outside of them should be low walls, rising four or six inches above the level of the borders, upon which the plate of timber must be laid, on which the sloping glasses are to rest. The glasses must be divided into two ranges, being contrived in such a manner, as that the upper row may slide down, and be fastened at suitable distances, but the lower may be either fixed or moveable; and the sloping timbers, which support the glass-frames, must be fastened at bottom into the ground-plate in the front of the border, and at the top into strong iron cramps, fixed in the upper part of the wall for the purpose. They are best made of fir, which does not twist, as oak and some other wood, where it is laid in such position; and on the top should be fixed, in a close manner, a strong board, under which the upper row of glasses should slide, in order to secure the upper part of the glasses from being raised by the winds, and keep the wet from the trees. It may project on the top glasses about two inches. The width of the frames may be about three feet, or according to the extent of the wall, the bars being placed lengthways of them. See STOVE, and WALL, *Hollow or Forcing*.

Walls in gardens are not only of great utility, importance, and advantage, as serving the purpose of defences against external injuries, and as sheltering against cold, cutting winds, high stormy blasts, and all sorts of severe exposure, but also as affording the means of having different sorts of fruit-trees trained against them, for the production of finer, more early, and better perfected fruit. Indeed, without their assistance, many of the more tender sorts of fruit-trees cannot be made to mature and ripen their fruit in any full perfection, in this climate.

These are those of the peach, nectarine, apricot, vine, fig, and other similar kinds, all of which stand in need of nearly the best full south walls to produce their fruits in the fullest and finest proportion, having their branches trained in close, in a regular expanding manner upon them, in order to have the full benefit of their warmth and protection during the time of their early blossoming, and setting their fruits in the spring months; and afterwards to obtain the most complete influence and advantage of the sun, in bringing them forward in the most effectual manner to the above noticed state of maturity, in due season, and with the greatest richness of flavour.

Walls are likewise useful for most or all of the more common hardy sorts of fruit-trees, notwithstanding they are capable of producing good fruits abundantly without the aid of them, as they are thereby afforded more early, and in superior states of perfection as to size, beauty, and fineness of flavour. Where any of the better sorts of these have the advantage of being grown against a south, south-west, or east wall, their fruits become ripe early, and in a perfectly mature manner; and commonly the early as well as later kinds acquire still more improved states of perfection and fineness of flavour, some of them for immediate eating, others for keeping different lengths of time. This is the case in the chief sorts of the cherry kind, in the choicer sorts of plums, the capital sorts of the finest eating pears, of the summer, autumn, and winter kinds; as also in some highly valued sorts of the eating apples of these different seasons.

And by planting some of these several hardy sorts of fruit-trees against walls fully to the south, others against those which have a westerly aspect, and a few on those towards the east and north, the best sorts of their different fruits will be produced in succession, both at an early and late period.

Where walls are situated in the interior parts of garden grounds, or near their boundaries, with pieces of ground and boundary fences exterior to them, they may be furnished and planted with the most choice sorts of fruit-trees on both sides, suiting them to the nature of the aspect, in both the tenderer and more hardy kinds, some being placed on the full south walls, others on the west and east aspects of them, as well as on their northern exposures: however, in general, allotting those of the best sorts, of the former as well as latter description, to the walls with southern exposures or aspects, as all those of the peach, nectarine, apricot, vine, fig, and other like sorts of the tender varieties of fruit-trees, as noticed already; and some of those of the finest kinds of cherries, plums, pears, and apples, in the more hardy fruit-tree kinds.

The less fine kinds of all or most of these tender and hardy sorts, but chiefly of the latter, may be planted against the walls which have western and eastern aspects; and those which have northern exposures or aspects may have some of the latter sorts, as some kinds of summer pears, plums, morello cherries, and currants, for later successional ripening, placed against them.

Experience has now pretty fully shewn, that the crops of fruit are the most abundant, and of the best quality, where the walls, against which the trees are arranged and nailed, are well built in the perfectly straight form, as they protect the blossoms and young fruit in the most favourable manner for the purpose.

WALL, *Hollow or Forcing*, that sort of wall which is constructed

ftructed in fuch a manner as to contain fire-heat for the purpofe of forwarding and ripening the fruit of the trees planted and trained againft it at an early feafon, as already feen in fpeaking of garden-walls. It is commonly fupplied with a frame of glafs-work in the front of it, extending to different diftances according to circumftances; but is fometimes without this convenience, in which cafe the moft material circumftance, befides the arrangements for the conveyance of the fire-heat, is that of the furnace, and the contriving and conftructing of a covering of canvafs or netting which is to be let down over the trees in fevere weather, and in the night time. The flues being conftructed in fuch a manner as to diftribute the fire-heat equally over the whole, and of fufficient thicknefs to prevent its too great efcape or diffipation, the moft fit and beft adapted furnace for the purpofe, is that made in the foundery of Cook and others in London, as well as in thofe of fome other places, and which is employed in moft modern hot-houfes, to which a damper is connected. Its great fuperiority has been found, in a ftriking manner, in many different inftances where trials were made with it by Mr. London. The covering is beft contrived and conftructed of Scotch gauze, or a fmall fort of netting, on fmall rafters fixed from the top of the wall into the border about three feet diftance from the roots of the trees; along the lower ends of which the roller for containing the covering is to be faftened; when by means of cords and pullies it can readily and with facility be drawn up to the top of the wall, or rolled down, as there may be occafion.

On all walls of the hollow or forcing kind, a covering of this nature is effentially neceffary, and fhould not be omitted, as is too often the cafe, as it is of much importance in preferving the heat, and preventing the chilling effects of frofts, dews, and other fimilar wetneffes which are continually taking place. The common modes of forming walls of the hollow or forcing kind have been defcribed in confidering garden-walls, and improved methods of conftructing the flues in fuch cafes may be feen under the head ftove. See Stove.

Hollow walls too, it is fuppofed, may be advantageous for thofe of the common garden kind, in many cafes, by containing air, &c. See a paper by Mr. Stevenfon, in the firft volume of the Memoirs of the Caledonian Horticultural Society.

Hollow, flued, or forcing walls, are very great acquifitions to fruit gardens in the northern parts of the kingdom on many accounts; and it is faid to be a great improvement in them not to have the furnaces placed too clofe upon the walls, or the flues to lead too directly forward to the front, but the former to be kept back, and the latter to fweep along five or fix feet, before they reach the front brickwork.

Wall-*Fruit* is the name of all that fort which is produced by the trees which are planted and trained againft walls, and which is raifed and procured by means of them, moftly in the fineft perfection. It comprehends a great number of different forts of fruits both of the finer and more common kinds, as all the peach and nectarine forts; moft of the apricot, fig, and vine kinds; many of the finer varieties of the plum, cherry, and pear forts; fome of the beft and moft early eating apples; fometimes the early and large mulberry; the earlier and finer kinds of the goofeberry and the currant; befides a variety of other forts in different cafes. It confifts of much of the beft of our finer as well as commoner forts of fruits, and is that which is generally held in moft eftimation, and of the greateft value for the ufes of luxury. In order to have it at the table in the greateft perfection, it fhould always, in moft of the kinds, be ufed as foon as poffible after it is taken from the trees, and while it has its peculiar bloom upon it, as it becomes afterwards far inferior in its qualities for the purpofe of eating as well as the beauty of its appearance.

Wall-*Trees*, fuch fruit-trees as are planted againft walls, and have their branches trained to them in a fanned or fome other regular manner, from three or four to five or fix inches afunder, in order to produce their fruits more early and in a fuperior degree of perfection. They are trees of the more tender kinds, or fuch as will not ripen their fruits in this climate, unlefs trained againft walls of a foutherly afpect, to have the advantage of the full fun; and of the feveral forts of the hardier kinds, to obtain their fruits in earlier maturity, and of an improved growth and flavour.

The trees of this fort may be confidered as confifting of two orders or forms of growth; one of which is of the common dwarf wall kind, and the other of the half ftandard wall fort. But thofe of other forms of growth may occafionally be employed in this way with convenience and advantage.

Thofe of the firft of thefe kinds are fuch as are trained with fhort dwarf ftems of only a few inches in height, and which, of courfe, are made to branch out near to the furface of the ground, in order that they may cover the wall by their different branches in a regular manner quite from the bottom of it in an upward direction to the very top, being laid in in fomewhat a horizontal or fanning direction, at the diftance from each other of not more than from three or four to five or fix inches, according to circumftances as already fuggefted.

Thefe are the common fort of wall-trees for general planting in this way, all the different kinds being ufually originally trained in the wall-tree order; and for which ufe thofe commonly raifed by means of grafting and budding are always grafted and budded low in the ftock or ftem, as within four or five inches of the upper part of the ground, the firft main fhoots proceeding directly from the inferted grafts or buds, being when of one year's growth headed down or cut in, in the early fpring months, to four or five eyes, in order to the production of a proper fupply of lateral fhoots, the fame year, from them near to the ground, to give the trees the fuitable form of head at firft, they being trained and laid in on the walls in a fpreading order both ways of them, at their full lengths during the fummer; and in the early fpring afterwards they are pruned or cut in to fix or eight eyes for a further fupply of fimilar lateral fhoots, for the purpofe of increafing the bottom branches, which are trained in the fame manner, in order to afford a fuitable foundation, as it were, in the advanced heads, for furnifhing in a gradual manner all the other neceffary branches in a regular way up to the top of the walls, as they may be wanted. And the fame methods muft be purfued with fuch trees as are raifed and propagated by layers, cuttings, and fuckers, as thofe of vines, figs, and fome other forts, when they are intended for wall-trees; their proper after-management being fuch as is directed under the proper head of each individual fort. See thefe different heads.

The latter fort, or the half ftandard wall-trees, are ufually trained with rather high ftems of the ftandard kind, as from three, four, or five, to fix feet, being grafted or budded at fuch heights, in order that they may branch or throw out fhoots above in the way which has been already noticed.

Thefe forms of trees are fuited for occafional planting againft high walls between thofe of the common dwarf kind, in the view of having the whole of them, both above

and below, covered as ſoon as poſſible, as the dwarf trees occupy the lower parts, while the half ſtandards take up the higher, and, of courſe, there is not any loſs of empty ſpace ſuſtained. This ſort of wall-trees have likewiſe their firſt and ſecond year's ſhoots from the grafting or budding pruned in the ſame manner as directed above, for the formation of the heads of the common wall-trees, and they are trained to the walls in exactly the ſame modes; their after-management having a relation to their particular natures, as may be ſeen under their reſpective heads. See alſo STANDARD *Trees*, and TRAINED *Trees*.

The other ſorts are only admitted as wall-trees, in particular caſes and ſituations, and where they are of ſuch natures and kinds, as do not permit of the methods of pruning and training, which are neceſſary for the trees which are commonly employed as wall-trees.

Wall-trees may therefore be either young plantable ones of one year's growth with proper heads, raiſed by means of budding or grafting, planted at once where they are conſtantly to ſtand and grow, to be pruned and trained in the above manner; or they may be ready trained young trees, of three or four years' growth or more, furniſhed with ſpreading branchy heads, which have been regulated and wrought on the walls, palings, ſtakes, or other ſorts of ſupports in nurſery grounds for the above lengths of time, and which are advanced to the proper ſtates of growth for immediate bearing, being kept in ſuch public grounds for the ſupplying of ſuch perſons as are deſirous of having their walls immediately covered with ſuch ſorts of trees. The particular methods to be purſued in pruning, training, and managing each ſort, may be ſeen deſcribed under the above heads of STANDARD and TRAINED *Trees*.

But there are beſides, moſtly in theſe nurſery grounds, a great choice of all the different ſorts and varieties of the fruit-tree kind for walls, both of the young untrained deſcriptions for being firſt planted out and trained from the beginning, as common dwarf or half ſtandard wall-trees, and which will reach the bearing ſtate in from two or three to four or five years, according to their kinds; and of thoſe which have been already trained as above in all the different ſorts proper for bearing in the following ſeaſon.

Theſe ſorts of trees muſt be trained to ſouth walls, for the principal ſorts of the more delicate or tenderer kinds, ſuch as peaches, nectarines, apricots, grapes, figs, &c., to have the benefit of the full ſun, as they do not ripen in good perfection without this aſſiſtance. Some of the beſt varieties of the principal ſorts of the hardier fruit-trees, as the moſt eſteemed cherries, plums, and pears, ſhould be alſo trained to theſe walls to produce early fruit in the greateſt perfection; alſo ſome trees of the choicer ſorts of ſummer and autumn apples, to have the fruit earlier, and of an improved rich flavour for immediate eating: likewiſe ſome of the beſt red and white currants and gooſeberries; and on weſt and eaſt walls to have trees of moſt of theſe ſorts, to ripen in good perfection, in ſucceſſion to thoſe on the ſouth walls, eſpecially cherries, plums, and pears, and occaſionally ſome common peaches, nectarines, and apricots; but vines and figs generally on ſouth walls, eſpecially vines, which require all poſſible benefit of the full ſun to ripen the grapes in proper ſeaſon, and with a rich flavour: the north walls are eligible for any of the common hardier ſummer and autumn fruits, as cherries, particularly morellos, plums, and pears, for late ripening, to ſucceed thoſe of the more ſunny expoſures, and to continue a longer ſucceſſion of particular ſorts, which ripen for immediate eating from the trees; alſo white and red currants for ſucceſſional ripening in the autumn as has been already ſeen.

The proper ſeaſon for planting wall-trees is either in autumn, as in October, November, &c., or in ſpring, as February and March, or not later than the beginning of April, but before that time, if poſſible; as late ſpring-planting, after the young trees begin to puſh their ſhoot-buds, is often attended with bad ſucceſs, as they are apt to become ſtunted or quite ſtopped in their growth.

The ſoil for wall-trees ſhould be a good dry mellow garden-earth, not leſs than one full ſpade deep; but if two or more it will be advantageous: or where a good moderately light loamy ſoil prevails, it is ſuperior for moſt ſorts of fruit-trees; and when enriched by good garden compoſt it is ſtill more beneficial. The poorer borders ſhould be enriched by means of good ſurface loam and rotten dung before the trees are planted in them.

In planting wall-trees, the borders ſhould either be wholly dug over a good depth, as two ſpits, or the parts about where the trees are to be placed only, proper ſized circular holes or pits being made in depth and width according to the nature of the roots of the tree plants, the mould taken out being laid on the ſides; the diſtances from each other being regulated by the height of the walls and the nature of the growths of the trees. For thoſe of the peach, nectarine, apricot, fig, plum, and cherry kinds, fifteen or eighteen feet are little enough. Vines require from five to ten and fifteen or more feet, according as they may be trained in upright, horizontal, or other directions, as they admit of all theſe ſeveral modes of regulating their heads. Pears, apples, and other trees of ſimilar growths, ſhould have eighteen or twenty feet, eſpecially when worked on free ſtocks, and thoſe on dwarf ſtocks not leſs than fifteen or eighteen feet of diſtance from each other.

The wall-trees intended to be planted are then to be carefully taken up from the nurſery or other grounds, with their full ſpread of roots as perfect as poſſible, the broken, bruiſed, and injured parts, with any tap-roots and ſtraggling ones, being only cut away and ſhortened at the moment of replanting them; and in the heads where they are young trees of one or two years' growth only, with the firſt main branches or ſhoots from the budding or grafting quite entire, not having been headed down or cut in, in the nurſery, they may be retained whole until after they are planted, or not be pruned in until the ſpring; and where they are trained trees of ſome years growth with regular trained heads of ſome years ſtanding, the very irregular ill placed fore-right ſhoots, diſorderly growths, and rank ſummer ſhoots, which are unfitly ſituated for training in ſhould be cut away: all the well placed ſide and terminal ſhoots being left quite entire until after the time of planting the trees at leaſt. Then in planting, place the trees in the pits or holes with the bottoms of the ſtems about five or ſix inches or more from the walls, inclining the top parts and heads to them in a cloſe manner, ſpreading the roots out with regularity in the pits or holes, ſhovelling in the mould or earth from the ſides with exactneſs and equality, breaking the lumps and clods well, and ſhaking the trees up and down a little, in holding them by the ſtems, in order to make the mould ſink in well between the roots, fibres, and other parts, then filling them in to the tops of the holes in a careful way, ſeeing that the upper roots are at leaſt three or four inches below the ſurface, and ultimately treading the whole down in a moderate manner, to ſettle the earth about the roots, and give the trees their proper poſitions againſt the walls. Proper watering will moſtly be immediately neceſſary in moſt caſes, and which may be repeated as there is occaſion, to ſettle the earth more cloſely, and promote the ſtriking and growth of the trees.

Wall-trees require the above methods of pruning and training to form their different heads in their young growths; and afterwards in an annual manner to retrench their over-luxuriant ſhooting, and keep them within due limits and in regular order, for the production of full crops of the beſt ſort of fruit of their different kinds. In theſe views they ſtand in need of a regular ſummer and winter pruning every year, as well as a conſtant unnailing and renailing in the proper methods and times of the ſeaſon.

The methods of planting, training, pruning, and nailing of the different ſorts, are explained in the ſeveral heads, under their particular culture.

Wall-trees beſides walls are ſometimes planted and trained againſt wooden erections, ſuch as palings and thoſe made in a cloſe manner with boards, which though they are not ſo warm as brick or ſtone walls, and conſequently not ſo productive of early good fruit, yet they ſometimes afford it in tolerably good perfection at a little later period.

Great advantage is ſaid to have been lately attained in bringing ſome ſorts of wall-trees into a bearing ſtate, eſpecially pears, by turning the branches of them over the walls, and nailing them in an inverted manner on the other ſide.

It is ſtated by ſir Joſeph Banks, in a paper in the firſt volume of the Memoirs of the Caledonian Horticultural Society, that he has practiſed this method, which ſeems to have been learned from a market-gardener in the vicinity of London, with the beſt ſucceſs on the ganſel bergamot pear, which is not very free of bearing. It had ſtood againſt a north wall for ſeveral years, without once making a fruit bud. About three years ago, he turned it over the wall, and had it nailed with the branches pointing downwards: the ſpring after, it bore, it is ſaid, about a dozen of very fine pears, and this autumn, the ſouth-ſide wood, which has increaſed very much, produced at leaſt ten dozen of the fineſt pears his garden afforded.

This practice, it is ſuggeſted, is now become not unfrequent in the royal gardens, where pear-trees on a weſt wall have been turned over to the eaſt ſide, and conſiderable crops annually obtained from ſuch inverted branches.

Sir Joſeph has likewiſe ſucceeded perfectly in bringing duke cherries over from the north wall, on which aſpect they here produce a valuable crop of cherries for the months of July and Auguſt. The branches brought over to the ſouth wall afforded the earlieſt fruit, it is ſaid, and had the largeſt and faireſt berries. This, in our climate, is ſuppoſed a material improvement, as duke cherries ſeldom ſucceed on a ſouth wall: the tree requires to have its root cool, and when it is expoſed to the rays of a ſouth ſun, produces in general ſmall and imperfect fruit.

The ſame mode, and ſome other ſimilar ones, will probably ſucceed with many other ſorts of wall-trees, as well as theſe.

The taller ſorts of wall-trees are ſometimes termed wall-ſtandards.

WALL-*Creſs*, in *Botany*. See ARABIS.

WALL-*Flower*. See CHEIRANTHUS.

WALL-*Pennywort*. See COTYLEDON.

WALL-*Pepper*. See SEDUM.

WALL-*Rue*. See ASPLENIUM.

WALL *of a Stack*, in *Agriculture*, a term ſometimes made uſe of to ſignify the ſtem, body, or that part which extends from the ground to the eaves, and which ſpreads out in its upward direction ſo as to throw off the water. It is of ſome conſequence to have the walls of ſtacks built in a neat and exact manner, in the preſerving of the grain as well as in the keeping of vermin out of them. See STACK.

WALL-*Eyes*, in *Horſes*, are thoſe in which the iris, or middle part, is of a very light grey colour. Such horſes are not conſidered handſome; but ſome ſay that thoſe horſes which have wall-eyes are moſtly of a good kind. See HORSE.

WALL-*Springs*, in *Agriculture*, a term applied to thoſe which break out through ſome laminated rocky ſtrata, or on cold ſpewy or ſpringy wet clayey ground. The water in theſe caſes moſtly drops or oozes out in a ſlow manner. See SPRING.

WALL-*Creeper*, in *Ornithology*. See PICUS *Murarius*.

WALL-*Moſs*. See MOSS.

WALL-*Sided*, denotes the figure of a ſhip's ſide, when, inſtead of being incurvated ſo as to become gradually narrower towards the upper part, it is nearly perpendicular to the ſurface of the water, like a *wall;* whence the phraſe. See SHIP.

WALL'*s End*, in *Geography*, a townſhip of England, in Northumberland, famous for its collieries; 5 miles E.N.E. of Newcaſtle.

WALLA, the name of an officer in the eaſtern nations. See WALI.

WALLACE, *Sir* WILLIAM, in *Biography*, a hero of Scottiſh fable and romance, was a diſtinguiſhed patriot and warrior in the thirteenth century, who belonged to an ancient family in the weſt of Scotland. Hardy and magnanimous, and ardently attached to his country, he engaged in the arduous undertaking of liberating the land of his nativity from the foreign yoke of Edward I., king of England. Having killed an Engliſh officer in a quarrel, he retired for ſafety into the woods, and put himſelf at the head of a band of outlaws, and commenced an incurſive war againſt the Engliſh, who were ſtationed in that country. Succeeding in his firſt enterpriſes, he was joined by many barons, whoſe cauſe was ſecretly favoured by Robert Bruce. But earl Warrene, appointed by Edward to the government of Scotland, collected an army of 40,000 men in the north of England, and marching into Annandale, terrified the inſurgents, ſo that many of the Scotch nobles ſubmitted, and others joined the Engliſh army. Wallace, with his adherents, retired northwards, and being purſued by Warrene with his forces, he engaged them near Stirling, and defeated them with great ſlaughter. This ſucceſs enhanced the reputation of Wallace, and he was declared regent of the kingdom under the captive Baliol. Wallace retaliated on the Engliſh, and extended his ravages as far as Durham, and recovered Berwick. Edward, upon receiving this intelligence in Flanders, haſtened his return, and marched with 90,000 men to the northern frontier. Wallace, perceiving the jealouſy and diſcontent occaſioned among the nobility by his high rank, reſigned the regency, and merely retained his command over his own followers. When the Scotch were joined by Edward at Falkirk, in 1298, a battle enſued, in which the Engliſh obtained a victory; but Wallace, whoſe body of forces was unbroken, retired behind the banks of the Carron. After this defeat Wallace ſtill maintained an unſubdued ſpirit, and aſſerted his independence. Edward, apprized that he was inſecure whilſt ſuch an adverſary as Wallace lived, uſed various means for diſcovering his retreat and ſeizing his perſon. He at length ſucceeded, by the treachery of his friend, ſir John Monteith. The captive was conveyed to London, where, though he had never ſworn fealty to the Engliſh ſovereign, he was tried, condemned, and executed as a traitor, Auguſt 23, 1305. His memory is ſtill revered in his native country, and he has been celebrated by national ſongs, and a variety of eulogies, the ſubjects of which have been partly true, and partly fabulous. Hume. Henry.

Wallace, in *Geography*, a small island near the coast of South Carolina. N. lat. 33° 54′. W. long. 78° 35′.

Wallace-*Town*, a town of Scotland, in Ayrshire, founded about the middle of the eighteenth century by sir Thomas Wallace; 3 miles N.E. of Ayr.

WALLAGE, a river of Germany, which runs into the Ems, at Lingen.

WALLAPATAM, a town of Hindoostan, in the country of the Nayrs; 14 miles W.N.W. of Palicaudchery.

WALLASEA, an island in the German sea, on the coast of Essex, at the mouths of the Coln and Black Water. It contains two parishes, East and West Mersey. It is about four miles long, and one and a half broad. N. lat. 51° 38′. E. long. 0° 48′.

WALLE, a town of Germany, in the county of Verden; 4 miles N. of Verden.

WALLEBERGA, a town of Sweden, in the province of Schonen; 38 miles S. of Christianstadt.

WALLENBURG, or Walenburg, a town of Switzerland, and capital of a bailiwick, in the canton of Bâle; 12 miles S. of Bâle.

WALLENFELS, a town of Bavaria, in the bishopric of Bamberg; 7 miles E. of Cronach.

WALLENIA, in *Botany*, was so denominated by professor Swartz, in honour of Matthew Wallen, esq., an Irish gentleman, long resident in Jamaica, the friend and coadjutor of Dr. Patrick Browne, in his well-known Natural History of that island. Mr. Wallen spared no expence in the cultivation of plants. The stoves of our most distinguished gardens are indebted to him for their choicest rarities. His name occurs amongst the contributors to Kew Garden, and he also sent many fine plants to the late marquis of Rockingham; amongst others, in the year 1778, the splendid *Euphorbia punicea*, Sm. Ic. Pict. t. 3. Curt. Mag. t. 1961, which, being supposed a new genus, for some time bore the name of *Wallenia*, though without any scientific claim to be separated from its congeners.—Swartz Prodr. 31. Ind. Occ. 247. t. 6. Schreb. Gen. 789. Willd. Sp. Pl. v. 1. 618. Mart. Mill. Dict. v. 4. Poiret in Lamarck Dict. v. 8. 785. Petesioides; Jacq. Amer. 17.)—Class and order, *Tetrandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four erect obtuse segments, permanent. *Cor.* of one petal, tubular: tube cylindrical, erect, longer than the calyx: limb in four shallow, ovate, obtuse, erect, converging segments. *Stam.* Filaments four, inserted into the base of the corolla, dilated at the bottom, half erect, as long again as the corolla, and rather spreading in that portion beyond its limb; anthers ovate, incumbent. *Pist.* Germen superior, oblong; style awl-shaped, shorter than the stamens and corolla, permanent; stigma simple, obtuse. *Peric.* Berry roundish, of one cell. *Seed* solitary, roundish, with a brittle shell.

Obs. Some male flowers occasionally occur, which have no pistil, rendering the genus polygamous. *Swartz.*

Ess. Ch. Calyx four-cleft, inferior. Corolla tubular, four-cleft. Berry with one seed.

1. W. *laurifolia.* Laurel-leaved Wallenia. Swartz. Ind. Occ. 248. Willd. n. 1. Poiret n. 1. (Petesioides laurifolium; Jacq. Amer. 17, a temporary name only. Bryonia nigra fruticosa, foliis laurinis, floribus racemosis speciosis; Sloane Jam. v. 1. 234. t. 145. f. 2.)—Branches round.—Native of bushy places, on the mountains of Jamaica and Hispaniola, flowering in spring and autumn. The Spaniards call it *Laurier.* The *stem* is woody, from ten to twenty feet high, having a smooth bark, and no thorns or prickles. *Branches* long, subdivided, round, as thick as a goose-quill, twining about every thing in their way, marked with scars from the insertion of former foliage. *Leaves* on round smooth footstalks, (whether alternate or opposite, Dr. Swartz does not mention, nor can Sloane's figure be trusted; Jacquin says alternate,) obovate, obtuse, entire, smooth, shining, slightly ribbed and striated, about four inches long, and almost half as broad in the middle. *Stipulas* none. *Panicle* terminal, with spreading, alternate, partly level-topped, subdivided branches. *Flowers* stalked, yellow, inodorous, about half an inch long, numerous, and, according to Sloane, very beautiful. *Berry* scarlet. The *calyx*, *corolla*, *fruit*, and organs of impregnation, are sprinkled with glandular, orange-coloured dots. The ripe *berries* are slightly acid and aromatic, like the parts of the *flower*; the *seed* tastes like the pepper tribe. *Swartz.*

We cannot but remark that Willdenow copies, without examination or scruple, two errors from Swartz, in the rereference to Sloane.

2. W. *angularis.* Angular-branched Wallenia. Jacq. Hort. Schoenbr. v. 1. 13. t. 30. Poiret n. 2.—Branches angular.—Native of the East Indies. Jacquin says it is cultivated in the island of Mauritius, from whence a living plant was brought to the imperial garden at Schoenbrun. It has flowered there in the stove, every year in May, but never bore any fruit. The *stem*, in the island above mentioned, attains the height of twenty-five feet, and is as thick as a man's leg. *Branches* all angular, smooth. *Leaves* much like the foregoing, but larger; alternate on the lower part of each branch; opposite, or even whorled, above; all very smooth and shining. *Panicle* terminal, erect, many-flowered, somewhat corymbose; its ultimate divisions umbellate, or capitate. *Flowers* green, about the size of *W. laurifolia*, but the *calyx* seems less deeply divided, more hairy, and the *corolla* smoother. *Stigma* downy.

WALLENSEN, in *Geography*, a town of Westphalia, in the principality of Calenberg; 15 miles S.E. of Hameln.

WALLENSTADT, a town of Switzerland, near the E. end of Wallenstadt Lake, in the county of Sargans, and principal place of a bailiwick. This place has a Schultheiss, and council of its own; the first of whom is nominated by the landvogt out of three burghers, presented for his approbation. It is a great thoroughfare for goods to and from Italy. It is the place likewise where the Switzers and Grisons hold their conciliatory meetings on all claims made by either party; 35 miles E.S.E. of Zurich.

Wallenstadt, a lake of Switzerland, surrounded with mountains and sharp rocks, which render the navigation dangerous; 9 miles long, and 2 wide; 9 miles S. of Utznach.

WALLER, Edmund, in *Biography*, an English poet of distinguished celebrity, was the descendant of an eminent family, and born at Coleshill, Hertfordshire, in March 1605. His mother was the sister of the famous John Hampden. By the death of his father, when he was an infant, he came into possession of an estate of 3500*l.* a year. Having received his school education at Eton, he was admitted at King's-college, in Cambridge; and exhibiting superior talents, as well as possessing powerful interest, he became a member of parliament in his sixteenth or seventeenth year. Of his poetical talents he exhibited an interesting specimen in his eighteenth year, by his verses on the "Prince's Escape at St. Andero," which far surpass in poetical melody the productions of his predecessors. He also, at an early period, augmented his patrimony by marrying a rich city heiress. During the intermissions of parliament, which occurred after the year 1628, he lived in a retired

retired manner at his house near Beaconsfield; pursued his classical studies under Morley, afterwards bishop of Winchester; and acquired improvement as well as celebrity from the society of polite scholars into which he was introduced. At the age of twenty-five years he lost his wife, and soon afterwards became the suitor of lady Dorothea Sydney, eldest daughter of the earl of Leicester, whom he has immortalized under the appellation of Sacharissa. But much as he admired this majestic and scornful beauty, as he denominates her, he was more delighted with the gentle Amoret, supposed to have been lady Sophia Murray; but failing to engage the attachment of either of these ladies by his poetic strains, he sought comfort under the anguish of disappointment in a second marriage. When parliament met in 1640, after a long suspension, Waller was again returned for Agmondesham, and joined the party which thought that a redress of grievances should precede a vote of supplies, urging their plea by an energetic speech. He was also a member of the long-parliament, and warmly opposed the exaction of ship-money, after the example of his justly celebrated uncle, Hampden. He farther distinguished himself by his eloquence in the impeachment of judge Crawley, with the conduct of which he was entrusted by the commons. He continued for three years to give his vote in general with the opposition, without concurring in all the measures of this party; particularly the abolition of episcopacy. In the progress of the dispute between the king and parliament, he discontinued for a time his attendance; though he manifested his inclination to the royal side by court panegyric, and when he again returned to the house, by remonstrating against its proceedings; and when the king set up his standard at Nottingham, it is said that he sent him 1000 broad pieces. As he was one of the commissioners appointed by parliament for treating with the king at Oxford, he was kindly noticed by his majesty; and he was probably thus induced to engage in a plot in his favour. Accordingly, he concerted measures with Tomkyns, clerk of the queen's council, for resisting the payment of the taxes levied for the support of the army, and promoting petitions for peace, and thus constraining parliament to adopt pacific measures. In the prosecution of this plan, they sought the concurrence of persons of influence in the city. Whilst they were thus employed, sir Nicholas Crispe, who was a zealous loyalist, was exciting the king's friends among the citizens to resist openly the authority of parliament, and with this view he had actually obtained a commission of array from his majesty. These two plots were, as Clarendon supposes, independent of each other; but however this be, the commission was known to Waller and Tomkyns. When these measures became known to persons in power, they were arrested; and the deficiency of evidence against them was amply supplied by the pusillanimity of Waller, who disclosed every secret of his party, and basely betrayed a number of persons, of different rank and station, who had reposed their confidence in his honour. Of this number were the earl of Portland, lord Conway, and the earl of Northumberland. He attempted also to persuade lord Portland to confess the charge, and to lay the blame on the two other noblemen just mentioned. Two conspirators, *viz.* Tomkyns and Chaloner, were hanged, and Waller saved his life by affecting a remorse of conscience, which disordered his understanding; so that he was merely expelled the house, tried and condemned, and after a year's imprisonment, and the payment of a fine of 10,000*l.*, permitted to go into exile. Thus disgraced in the estimation of all who made any pretensions to probity and honour, he first resided at Rouen, and from thence removed to Paris, where he lived like a man of fortune, and in the exercise of hospitality, on the means which he derived from the sale of his wife's jewels. After the interval of ten years, being reduced to his *rump* jewel, as he called it, he solicited permission to return to his native country, and having obtained a licence to this purpose, he took possession of a house which he had built near Beaconsfield. Unrestrained by principle, he paid his visit, by the effusion of his prostituted muse, to Cromwell, to whom he also paid a tribute of adulation after his death. He lost no time, however, in congratulating Charles II. on his restoration; and when the king took notice that his panegyric on Cromwell surpassed his congratulatory poem, he replied, with a happy courtly turn, "that poets always succeed better in fiction than in truth." Waller was again received into the best company, and though he drank only water, his wit and vivacity made him an agreeable associate to those who lived more freely and intemperately. He also obtained a seat in the house of commons, of which, though advanced in years, he was a lively and pleasant member. From the king he procured, in 1665, the appointment of provost of Eton college: but Clarendon, who was then lord-chancellor, refused to sanction it, because he was a layman. The conduct of the chancellor gave great offence to Waller, so that he joined the duke of Buckingham in his hostility against him, and both spoke and voted for his impeachment. Upon the accession of James II., Waller, in his eightieth year, was returned for Saltash, and availing himself of the privilege of age, spoke freely to the king, whilst he was treated by him with condescension and kindness. Once in conversation with the king he spoke of queen Elizabeth as the greatest woman in the world, to which James retorted, "I wonder you should think so; but it must be confessed she had a wise council." "And when, sir," replied Waller, "did you know a fool choose a wise one." When Waller was about to marry his daughter to Dr. Birch, the king expressed his wonder, "that he should think of marrying his daughter to a fallen church." He returned a message, in which he expresses his sense of the honour done him by the king's interest in his domestic affairs; adding, "I have lived long enough to observe that this church has got a trick of rising again." Foreseeing the storm that was gathering at the close of king James's reign, he observed, "that he would be left like a whale upon the strand." In his "Divine Poems," indicating the state of his mind towards the close of life, "it is pleasing (says Dr. Johnson) to discover that his piety was without weakness, and that his intellectual powers continued strong and vigorous." His death happened at Beaconsfield, in October 1687, in the eighty-third year of his age; and of several children by his second wife, his son Edmund, who represented Agmondesham in parliament, became a proselyte to quakerism. Of his moral principles and conduct, especially in the earlier period of his life, we can form no very high opinion. Lord Clarendon represents him as abject, and wanting courage to support him in any virtuous undertaking, and as combining servile adulation with a vain and imperious temper; but Clarendon, it will be recollected, was somewhat prejudiced in forming a judgment, which is, upon the whole, too just. He acknowledges, however, that he possessed superior powers of eloquence, and that the exuberance of his wit, and pleasantness of his conversation, which made him a chosen companion, were sufficient to cover a multitude of great faults. As a poet, he is said by one of his biographers to have possessed "character and intrinsic merit enough to retain no mean seat on the English Parnassus;" "he trifles with ingenuity, and is serious with an

an air of grandeur:"—and "his works can never fall into neglect with the student of poetry." Biog. Brit. Johnson's Lives of the Poets. Clarendon. Gen. Biog.

Waller, in *Rural Economy*, a term applied to a person employed in building wall-fences, and other sorts of walls, as well as to a labourer engaged in manufacturing salt from brine in salt-works, who is so called in consequence of raising a bank or walling round the pit, by means of the rubbish collected in long preparing salt. They both require to be well experienced persons. See Fence, Salt, and Salt *Brine Springs*.

Waller *See*, in *Geography*, a lake in the archbishopric of Salzburg, of an oval form; four miles long, and two broad, where widest; 4 miles N. of Salzburg.

WALLERIUS, Nicholas, in *Biography*, an eminent Swedish philosopher and divine, was born in Nerika in the year 1706, and completed his education at Upsal, whither he removed in 1725. Having here distinguished himself by his proficiency in the Wolfian philosophy, he commenced, in 1737, a course of lectures on both philosophy and mathematics, which employed, in consequence of the number of attendants, a very considerable portion of his time. In 1751 he took orders; in the following year he was honoured with the degree of doctor in theology; and in 1755 he was advanced to the chair of the new theological professorship, founded by Dr. Kelsenius, bishop of Westerös, with a view of vindicating the truth, and evincing the excellence of Christianity; and in this situation he gained universal esteem. He was also a member of the Academy of Sciences at Stockholm, and of the Academy at Upsal, the transactions of which were enriched by several of his communications. His important and useful life was terminated by a fever in August 1764. His principal works are "Systema Metaphysicum," 1750, 4 vols. 8vo.; "Compendium Logicæ," 1754, 8vo.; "Compendium Metaphysices," 1755, 8vo.; "Psychologia Empirica," 1755, 8vo.; "Psychologia Rationalis," 1758, 8vo.; "Prænotionum Theologicarum," six parts, from 1756 to 1765, 8vo. Gen. Biog.

WALLERN, in *Geography*, a town of Austria, on the Inn; 4 miles S. of Efferding.—Also, a town of Bohemia, in the circle of Prachatitz; 9 miles S.S.W. of Prachatitz.

WALLERSDORF, a town of Prussia, in Natangen; 18 miles S.W. of Brandenburg.

WALLERSTEIN, a town of Germany, with a castle belonging to the counts of Oettingen, called Oettingen Wallerstein; 4 miles N. of Nordlingen.

WALLERSVILLE, a post-town of the state of Georgia; 729 miles S. of Washington.

WALLETZ See, a lake of Brandenburg, in the Ucker Mark; 1 mile W. of New Angermunde.

WALLEY, or Wallia, a town of Africa, with an European factory, in the kingdom of Yani.

WALLHAUSEN, a town of the marggravate of Anspach; 4 miles N. of Creilsheim.

WALLI, a kingdom of Africa, to the sovereign of which Mr. Park paid custom in his journey.—Also, a second river.

WALLING *of Brick*. See Brick.

Walling, *Lead*. See Lead-*Willing*.

WALLINGFORD, in *Geography*, a very ancient borough and market-town in the hundred of Moreton, and county of Berks, England, is situated on the western banks of the Thames, at the distance of 15 miles N.N.W. from Reading, and 45 miles W. by N. from London. There are reasons for supposing it to have been a town in the time of the Romans, though its ancient name is lost: the present, whether derived from the British word Guallen, or the Roman Vallum, owes its origin to the ancient fortification with which it was surrounded, and its ford over the Thames. The earliest mention of Wallingford in history is in the year 1006, when it was destroyed by the Danes: it appears to have been soon rebuilt, as Swein, king of Denmark was there in 1013. In Edward the Confessor's reign it was a royal borough, and contained 276 houses, the inhabitants of which owed personal service to the king. The town was incorporated by king James I.; by whose charter the civil government is vested in a mayor, five aldermen, a town-clerk, and other officers, chosen out of the burgesses, who are eighteen in number. Wallingford has sent members to parliament from the 23d year of Edward I.: the right of election is in the corporation, and inhabitants paying scot and lot. That eminent lawyer, sir William Blackstone, who had a seat here, now the property of his son, represented this borough in parliament. Wallingford is a market-town by prescription: it appears by the Norman Survey, that in the reign of William Rufus the market was held on Saturday; it was afterwards changed to Sunday; and by a charter bearing date 1218, from that day to Monday. Here are now two weekly markets, on Tuesday and Friday, and four annual fairs. The market-house is a convenient structure, having a town-hall, and sessions-house over it. The town consists of two principal streets: its population, in the return of the year 1811, was stated to be 1901; the number of houses 380. The chief employment of the inhabitants is in agriculture and malt-making; of the latter article, 120,000 bushels have been annually made here. Leland says, here were anciently fourteen parish-churches, and that in his time there were persons living, who could shew the places where they stood. At present here are but three; St. Mary's, St. Peter's, and St. Leonard's: the two latter were nearly destroyed in 1646, when the town, being garrisoned for the king, was besieged for the parliament. St. Leonard's was repaired and opened for divine service in 1704: St. Peter's continued in ruins till the present reign; it was rebuilt principally by the exertions of sir William Blackstone, who erected the spire at his own expence; the new church was finished in 1769, the spire in 1777. St. Mary's, which is the principal church, has a tower surmounted by the figure of an armed knight on horseback. Here are also four meeting-houses for dissenters of different denominations; a free-school, founded by Walter Bigg, alderman of London, in 1659; and an alms-house for six women, endowed by Mr. William Aungear and his sister, about the year 1687. Wallingford-bridge, which crosses the Thames, is a substantial stone structure, three hundred yards in length, and consists of nineteen arches: from its appearance, it seems to vie with the oldest fabric of the kind on the river, but the time of its erection cannot be ascertained: the pointed angular starlings on the upper side are so well constructed, as to be able to resist the most violent floods; and the whole appears to be of immense strength. Near the river side are the mouldering ruins of the ancient castle, which, in the estimation of former ages, was regarded as impregnable, but they give no idea of that strength which regal armies besieged in vain. Camden was of opinion that it was of Roman origin; and Mr. Gough adds, that "the outer work of the castle is evidently Roman, and in a fragment of the wall at the entrance, the stones are laid herring-bone fashion, just as in the walls of Silchester." Having been destroyed by the Saxons and Danes, the castle was rebuilt and enlarged by William the Conqueror, when we learn, from Domes-

day-book, that eight houses were demolished to make room for this fortress. During the contest between king Stephen and the empress Maud, the latter resided in this castle, which was strongly fortified in her behalf: Stephen besieged it several times; but all his assaults were fruitless; the strength of the place, and the bravery of the garrison, effectually resisted his utmost exertions. In the reigns of king John and Henry III., this fortress was the scene of negociation between the kings and the discontented barons: it also bore a conspicuous part in the civil war between Edward II. and his nobles. When cardinal Wolsey was about to found a college in Oxford, Henry VIII. gave him this castle as a part of the endowment of his intended college; but on the cardinal's attainder, the grant appears to have been resumed. Leland, who visited Wallingford about that time, says, "the castle yoinith to the north gate of the toune, and hath three dikis, large and deap, and welle waterid. About ech of the two first dikis rennith an embatelid waulle, now sore yn ruine, and for the most part defaced. Al the goodly building, with the tourres and dungeon, be within the three dike." Camden, speaking of this castle, says, "Its size and magnificence used to strike me with astonishment when I came hither a lad: it is environed with a double wall and double ditch, and in the middle, on a high artificial hill, stands the citadel, in the ascent to which by steps, I have seen a well of immense depth." At an early period of the civil war between Charles I. and his parliament, Wallingford-castle was put into a state of repair; and being well garrisoned, was esteemed one of the most important fortresses in the king's possession. It escaped a siege till nearly the termination of the war: in 1646 it surrendered to the parliamentary forces; and an order of council for its demolition was issued November 18, 1652. So well was this order obeyed, that the greater part of it was destroyed. Within the walls of the castle was an ancient college, founded and endowed by Edmund, earl of Cornwall, nephew to Henry III., for a dean, four prebendaries, six clerks, and four choristers. Its revenues were further augmented by Edward the Black Prince and king Henry VI. Just within the west gate of the town was a convent of Benedictine monks, founded in the reign of William the Conqueror, by Paul, abbot of St. Alban's. The priory estate is now the property of William Hucks, esq. who has a farm-house on the scite. Among the more distinguished natives of Wallingford, were Richard, abbot of St. Alban's, and John, a monk of the same place, who both derived a surname from the place of their birth: the former was eminent as a mathematician, the latter as an historian.

One mile south of Wallingford is Choseley-farm, one of the largest and most compact in England; being let for 1000*l. per annum*: there is a barn on it 100 feet in length. It was formerly in the possession of the earls of Warwick; but is now the property of lord Kensington.—Beauties of England and Wales, vol. i. Berkshire; by J. Britton and E.W. Brayley, 1801. Lysons' Magna Britannia, vol. i. Berkshire, 4to. 1806.

Wallingford, a town of the state of Vermont, in the county of Rutland, containing 1386 inhabitants; 40 miles N. of Bennington.—Also, a town of Connecticut, in the county of New Haven. This town, called by the Indians Coginchauge, was settled in 1671. It now contains 2320 inhabitants; 12 miles S.W. of Middleton.

WALLIS, John, in *Biography*, a well known mathematician, was born at Ashford, in Kent, in the year 1616, and after finishing his school education, was admitted, in 1632, at Emanuel college, Cambridge, with a view to the church. Having taken orders, he commenced the duties of his ministerial office in 1641, as chaplain to sir William Darnley, in Yorkshire; and whilst he occupied the same station in the family of lady Vere, he had an opportunity of exhibiting his extraordinary talent in the art of decyphering. In 1643 the parliament, to which he was then attached, conferred upon him the sequestrated living of St. Gabriel, in Fenchurch-street, London; and in this year he published a quarto volume, entitled "Truth tried, or Animadversions on Lord Brookes's Treatise of the Nature of Truth." At this time he became possessed of a handsome patrimony by the death of his mother; and in 1644 he was appointed one of the secretaries of the assembly of divines. In the following year he concurred with those persons who laid the foundation of the Royal Society, and communicated specimens of his skill in mathematics; and in 1647 he discovered a new method of solving cubic equations. When the independents acquired an ascendancy over the covenanters, Wallis united with other ministers, who assembled at Sion college, in subscribing a paper, entitled "A Testimony to the Truth of Jesus Christ, and to the Solemn League and Covenant, as also against the Errors, Heresies, and Blasphemies of those Times, and the Toleration of them." In 1648 he subscribed a remonstrance against putting the king to death, and another paper, denominated "A serious and faithful Representation of the Judgment of Ministers of the Gospel, within the Province of London, in a Letter from them to the General and his Council of War." In the next year he was appointed by the parliamentary visitor Savilian professor of geometry, and quitting his church in London, entered himself of Exeter college, Oxford, where he became master of arts, and sedulously discharged the duties of his office, connecting himself with those who formed the Philosophical Society in that city. Towards the end of this year he became acquainted with Cavalleri's method of indivisibles, which he thought applicable to the quadrature of the circle; but after bestowing considerable attention upon it, it failed in completely answering his expectations. In 1653 he published, in octavo, his "Grammar of the English Tongue, in Latin," with an "Introductory Treatise on Speech," containing a philosophical inquiry into the formation of articulate sounds. MS. copies of letters which he had decyphered were this year deposited in the Bodleian library, together with an "Account of the Origin and Progress of Cryptography, or Secret Writing." In the following year he was admitted to the degree of doctor in divinity. In 1655 he printed the proposition in his "Arithmetica Infinitorum," relating to the quadrature of the circle, which he sent to Oughtred, and he afterwards published the whole work in quarto, with an introductory treatise on the conic sections, the principal properties of which he demonstrated, independently of the cone, by his method of infinites. At this time he published his "Elenchus Geometriæ Hobbianæ," containing a confutation of Hobbes's method of quadrating the circle, which was followed by an angry controversy of some continuance. In 1656 he brought out his tract "On the Angle of Contact," in which he contradicted the opinion of Peletarius, who had maintained that this angle had no magnitude. In the following year he published his "Mathesis Universalis, &c." and carried on a controversy with M. Fermat and M. Frenicle, in letters, which appeared in the "Commercium Epistolicum," in 1658. About this time he was chosen "custos archivorum" to the university; and he solved some prize questions proposed by Pascal, that related to the cycloid. His letter to Huygens, "De Conoide et Corporibus inde genitis," and also "De Cycloide,

Cycloide, &c." was publiſhed in 1659. His talent for decyphering recommended him to Charles II., by whom he was graciouſly received after his reſtoration; and who, beſides continuing him in his offices at the univerſity, made him one of his chaplains in ordinary. In 1660 he was concerned with thoſe who were employed in reviewing the book of common prayer; and having complied with the requiſitions of the act of uniformity, he retained his connection with the church till his death. Having ſuggeſted that it was poſſible to teach a deaf man to ſpeak, he tried his ſkill, in 1660, upon two deaf ſubjects, with a conſiderable degree of ſucceſs. After the eſtabliſhment of the Royal Society in 1663, Dr. Wallis, who was one of its firſt members, very much contributed to its reputation and permanence by his own communications, and by his account of mathematical papers, tranſmitted to it by other perſons. He alſo publiſhed, in 1663, his tract "De Proportionibus," and his illuſtration of the laws of motion in the colliſion of bodies; and in 1668 he preſented to the public his hypotheſis concerning the tides, in his treatiſe "De Æſtu Maris, Hypotheſis nova." In the following year appeared the firſt part of his principal work, intitled "De Motu," which was followed in the two ſucceeding years by the other two parts; and in 1671 he completed the whole, under the title of "Mechanica, ſive de Motu, Tractatus Geometricus." His other publications were "Horocii opera Poſthuma, with Flamſtead's Diſcourſe on the Equation of Time," 1673, and "Archimedes' Arenarius," and "Dimenſio Circuli," "Ptolemæi Opus Harmonicum," with Latin verſion, and notes, 1680, and an "Appendix de Veterum Harmonica, ad hodiernam Comparata;" "Porphyrii in Harmonica Ptolemæi Commentarius ex Codice Manuſcripto, Græcè et Latinè editus, et Manuelis Bryennii Harmonica ex Cod. Man:" his "Algebra," 1684, with his Arithmetic of Infinites, the Infiniteſimal Method of Leibnitz; and that of Fluxions, by ſir I. Newton;"—"Three Diſſertations upon Melchizedek, Job, and the Titles of the Pſalms," 1685;—"Inſtitutio Logica," 1687; "Ariſtarchus Samius de Magnitudine Solis et Lunæ," with "Pappi Alexandrini Libri Secundi Collectionum Mathematicarum hactenus deſiderati Fragmentum," 1689; and alſo a letter to ſir Samuel Moreland, in order to prove that Des Cartes borrowed his improvement in algebra from his countryman Harriot:—"The Doctrine of the Ever-bleſſed Trinity," 1690; and "On the Chriſtan Sabbath," 1691. About this time the curators of the univerſity-preſs at Oxford began to collect his mathematical works, with a view of publiſhing them in the Latin tongue. The firſt volume was committed to the preſs in 1692, and the firſt two volumes appeared in 1696; and the third volume, containing the Commercium Epiſtolicum, or Letters concerning the original Author of the Method of Fluxions, and a Letter concerning the annual Parallax of the Earth, from Mr. Flamſtead, was publiſhed in 1698. Thus cloſed the ſcientific and literary labours of Dr. Wallis, who died in October 1703, in the 88th year of his age; leaving behind him one ſon and two daughters. Of his general character, moral and political, it will be ſufficient to ſay, that he was prudent and moderate, endeavouring, in the colliſion of parties, to promote what he conceived to be the true intereſt of religion and ſcience, and of the public community. As a mathematician, he is thought to have excelled in judgment and induſtry more than in genius. Biog. Brit. Hutton's Math. Dict.

Dr. Wallis was the firſt in our country who wrote on ſympathetic vibrations, and the diſcovery of Leſſons Harmoniques, or the harmonics of a ſingle ſtring (Phil. Tranſ.); but he ſeemed not to know that Galileo and Lemmi Roſſe in Italy, and Pere Merſenne in France, had preceded him in accounts of that phenomenon. See Basse Fondamontale, and Harmonics.

Dr. Wallis was the firſt man of ſcience in England who had read the Geeek writers on muſic publiſhed by Meibomius, who underſtood modern harmony, and who denied it to the ancients. He publiſhed Ptolemy's Harmonics, with a Latin tranſlation, and notes; Porphyry; and Bryennius. He ſeems to have ſtudied and underſtood the ſubject of the muſic of the ancient Greeks better than any of our countrymen. His papers in the Phil. Tranſ., his Appendix to Ptolemy's Harmonics, and notes on the authors he has tranſlated, are ſuch as manifeſt at once, by their clearneſs, learning, meditation, and ſcience.

Wallis's *Bay*, or *Harbour*, in *Geography*, a bay in the ſtraits of Magellan; 12 miles N.E. of Cape Forward.

Wallis's *Iſland*, a ſmall iſland near the ſouth-eaſt coaſt of New Ireland, at the entrance of Gower's-harbour, called Iſle de Marteaux by M. Bougainville; 9 miles N.W. of Cape St. George.

Wallis's *Iſlands*, in the South Pacific Ocean, diſcovered by Capt. Wallis in the year 1767, ſurrounded by a reef of rocks. The inhabitants were robuſt and active, quite naked, except a kind of mat wrapt round the middle. No other animal was ſeen, either bird or beaſt, except ſea-fowl. The trees were of different ſorts, and many of them large, the only fruit were a few cocoa-nuts. S. lat. 13° 18′. W. long. 177°.

WALLISHOFEN, a village of Switzerland, in the canton of Zurich. Here the French were defeated by the Auſtrians; 1 mile S.W. of Zurich.

WALLKILL, a poſt-townſhip of New York, in Orange county, with 4213 inhabitants, on a creek of the ſame name; 20 miles W. of Newburgh.

WALLOE, or Valloe, a town of Denmark, in the iſland of Zealand; 3 miles S. of Kioge.

WALLOE, a town of Africa, on the Ivory coaſt. N. lat. 5° 20′. W. long. 4° 55′.

WALLOOR, a town of Hindooſtan, in the Carnatic; 5 miles S.E. of Ongole.

WALLOP's Island, an iſland in the Atlantic, near the coaſt of Virginia. N. lat. 37° 48′. W. long. 75° 28′.

WALLSEY, one of the Shetland iſlands, on the North Atlantic Ocean, ſituated near the eaſt coaſt of Shetland; about ſix miles in length, and three in breadth. N. lat. 60° 35′. W. long. 1° 5′.

WALMER Castle, a fort of England, on the eaſt coaſt of Kent, near Deal. See Deal.

WALMERSLEY, a townſhip of England, in Lancaſhire; 4 miles N. of Bolton.

WALNEY, a narrow iſland in the Iriſh ſea, ſeparated from the coaſt of the county of Lancaſter by a narrow channel; about nine miles in length, but hardly one in breadth. It has two or three ſmall villages, and a chapel. The ſouth end is about 16 miles W.N.W. from the mouth of the Lune. N. lat. 54° 3′. W. long. 3° 10′.

WALNUT, a townſhip of Ohio, in the county of Fairfield, containing 694 inhabitants.—Alſo, a townſhip of Ohio, in the county of Pickaway, containing 759 inhabitants.

Walnut *Hills*, a mountainous ridge in the Miſſiſſippi territory, on the eaſt bank of the Miſſiſſippi, near the mouth of the Yazoo; N. lat. 32° 20′.

WALNUT-*Tree*, in *Botany*, *Gardening*, and the *Materia Medica*. See JUGLANS.

WALNUT-*Tree*, in *Agriculture*, the common name of a tree which is well known for the ufe of the nuts which it produces for the table, as an article for the deffert, and of their rinds, hufks, or coats, as well as themfelves in their unripe ftate, as an elegant, valuable, and agreeable pickle; alfo for its wood as timber, and its ornamental effect. It is on thefe and other accounts a very defirable tree for cultivation; but, in the firft intention, this is often in a great degree prevented, from the very great length of time which is required, in the ordinary modes of raifing it, before it becomes capable of bearing fruit in any fufficient quantity. The inconvenience arifing in this way has, however, lately, in a great meafure, been obviated by directing the following methods and means of producing and growing it. In addition to what has been faid of its modes of culture under JUGLANS, it may be farther noticed, that an ingenious cultivator of garden and orchard plants has, within thefe few laft years, from confidering the nature of what takes place in raifing fruit-trees of the apple and fome other kinds, from old bearing branches of other trees of the fame forts, by the practice of grafting; fufpecting that they never form what may with propriety be denominated young trees, the ftocks into which they are inferted only affording them nourifhment; and the new plants retaining, in all cafes, the characters and habits of the particular bearing branches of which they once formed parts, and commonly producing, in two or three years from the periods of their infertion, fupplies of fruit; been induced to believe that the effects of time might be anticipated in the culture of this and feveral other fruit-trees, which remain unproductive for a great many years after their being planted; and that parts of the bearing branches of them, when cut and detached from the old trees, and made ufe of as grafts, would ftill retain the character and habits of bearing branches.

Some walnut-trees of two years old or growth, which had been planted in the fpring feafon, fome time before, in garden-pots, were, in confequence, raifed up to the bearing branches of an old walnut-tree, by placing them on the tops of poles fet into the earth, and grafted by approach with parts of them. Their union took place during the fummer, and in the autumn the grafts were detached from the parent ftock. The plants thus obtained were afterwards planted in a nurfery-ground, and, without any peculiar care or management, produced both male and female bloffoms in the third fucceeding fpring, and have fince afforded bloffoms every feafon. It is noticed, however, that the froft has rendered their bloffoms, as well as thofe of other trees in their neighbourhood, wholly unproductive during the laft three years; and in the fpring of the year 1805, almoft wholly deftroyed the wood of the preceding year.

It is remarked that a fimilar experiment was made the fame year on the mulberry-tree, but under many difadvantages. Not having any young plants of this tree, the experiment could only be made with fcions of one year old or growth; and of thefe there were only two, which had fprung from the roots of a young tree, in the preceding year. Thefe were planted in pots, and raifed in the former method, to the bearing branches of an old tree. One of the fcions died; the other, which had very few roots, fucceeded; and the young grafted tree bore fruit the third year, and has continued annually productive. In the laft fpring it was introduced into the vinery, where its fruit ripened in the greateft ftate of perfection.

The walnut as well as mulberry-tree fucceeds fo ill in grafting, in any other manner than that by approach, that attempts to propagate them in any other way can fcarcely be recommended; but when they fucceed by other modes of this nature, nearly the fame advantages will probably be obtained. It is fuggefted, however, that the habit of the bearing branch is leaft difturbed by grafting in the approach method. The latter has been found capable of being produced by layers and cuttings from the ftrong bearing branches, and to be equally productive in thefe ways of raifing them. Great advantages, too, have attended pruning them in a careful manner, and training them againft fouth walls, palings, and other fuch fences.

The Spanifh chefnut fucceeds, it is obferved, readily, when grafted in almoft any of the ufual ways; and when the grafts are taken from bearing branches, the young trees afford bloffoms in the fucceeding year. And it is further fuggefted, that there is reafon to think, from experiments which have been made on this tree, that by felecting thofe varieties which ripen their fruit early in the autumn, and by propagating with grafts or buds from young and vigorous trees of that kind, which have only juft attained the age neceffary to enable them to bear fruit, it might be cultivated with much advantage in this country, not only for the ufe of the fruit, but for that of the wood as timber.

Similar experiments have likewife been tried on many other different forts of trees, which, it is remarked, have conftantly been attended with the fame refult; and no doubt is entertained but that the effects of time might be thus anticipated in the culture of any fruit, which is not produced until the feedling trees acquire a confiderable age. For the conviction of long and extenfive experience has fully fhewn, that the graft derives nutriment only, and not growth, from the young ftock into which it is inferted; and that with the life of the parent ftock, the graft retains its habit and conftitution, as well as perhaps other properties, as already fuggefted. See JUGLANS. See alfo different papers in the Tranfactions of the Horticultural Society of London.

The walnut is alfo a well-known deciduous tree, which was formerly much grown and cultivated in the field, and held in great efteem in this country for its wood, which is not unfrequently very finely veined; but which, in confequence of its aptnefs to be worm-eaten, has now, for the moft part, given place to mahogany. It is likewife an ufeful tree for the purpofes of ornament, and for its produce in fruit.

There are different forts of it, which are capable of being raifed and grown in thefe intentions with advantage; fuch as the common fort of walnut, which is a very large, lofty, fpreading tree, and which has many varieties, as the oval and round walnut, the large and fmall-fruited walnut, the double early and late walnut, the tender thin-fhelled walnut, and the hard thick-fhelled walnut; the white fort of walnut, which has the fruit fhaped like the common walnut, but in which the fhell is not furrowed, the tree being of a light colour. It is faid by fome to be a tall tree in North America, where it greatly prevails under the title of hiccory nut-tree; and the black walnut-tree, which is large, and has the outer covering of the nuts rough, with the form of them more round than in the firft of thefe forts. The fhell is very hard and thick, but the kernel fmall, though very fweet and agreeable to the tafte. Thefe two latter forts of walnut-trees are lefs hardy than that of the common kind, though very proper in fome cafes of planting. It has been noticed that all the firft forts of thefe trees vary again, when raifed from the feed, and that as the nuts from the fame tree will produce different fruit. Thofe who plant the walnut

walnut for the produce of its fruit should make choice of the young trees for that use, in the places where they stand, when they have their fruit upon them.

However, where these trees are intended for timber, it is probably the best practice to plant them out at once in the places where they are to stand or grow, as they thrive faster, and form better trees, it is said, in that method of raising them, than by any other means. The seed or nuts of the two latter sorts are to be procured from North America, and should be such as have been well ripened and secured.

These trees delight in a firm, rich, loamy soil, or such as is inclinable to chalk or marle; but they will thrive very well, it is said, in ground which is of a stony nature, or on chalk-hills, as is evident from those large plantations of them about Leatherhead, Godstone, and Carshalton, in the county of Surrey, where great numbers of these trees, planted on the downs near these places, produce, it is said, annually large quantities of fruit, to the no small advantage of their owners. Mr. Carlisle found the walnut raised from seed to be productive of fruit at a very early period, in one case, when grown on a soil the surface mould of which was of a dark colour, and of from eighteen to twenty inches in depth: it was what the workmen called a light soil; and immediately beneath which was a fine siliceous sand, about two feet thick; then a stratum of ochrey flint gravel; after which a red clay; and, at the depth of twelve feet, good water, arising from clean white sand.

The writer of the corrected account of the agriculture of Gloucestershire has, however, stated that this sort of tree will grow almost in any soil, that it wants no pruning or care, and that in less time than the oak it will make a large tree.

In planting these trees, when they are designed for the purpose of fruit, in such situations, it should not be done at less distance apart than about forty feet; and if more, it will be the better in many cases, where the soil is particularly suitable. But when for the wood or timber only, it may be performed in somewhat a closer manner with propriety, in most instances; though the trees, in such cases, should never be too much crowded together. When for ornament, single conspicuous trees have probably the best effect; but sometimes a few may be planted together with good effect.

The above writer remarks that the wood of this tree is too valuable to apply to the usual purposes of timber-trees, and is consequently always used either for cabinet-work, or for gun-stocks: for the latter use indeed, so great, it is said, has been the demand for a few years past, from the Birmingham gun-makers, that the district he is speaking of has been ransacked for this timber-wood, and very high prices have been held out to tempt the sale of it. In consequence of which, the stock has been much diminished there, so that, with very few exceptions, only a solitary walnut-tree is seen growing here and there; but that in the parish of Arlingham, in that county, there are more perhaps than in many other parishes of the same district combined: so abundant indeed was the fruit, it is said, that year (1805), that it became an article of commerce, and two vessels were then, in the beginning of October, being laden with walnuts for Scotland, at the above place, at a rate as low as four or five shillings a thousand; and that even at this price, the produce of a tree of this sort is highly valuable, as 20,000 nuts are not considered an extravagant calculation for a large tree.

Nay, were it only for the oil that these nuts afford, the trees that produce them would, some think, be worthy of some care. Evelyn has indeed observed, that one bushel of them will yield fifteen pounds of peeled kernels, and that these will yield half that weight of oil, which the sooner it is drawn is the more in quantity, though the drier the nut the better in quality. It is added too, that the lee, or marc of the pressing, is an excellent substance for feeding hogs with. It would certainly be good manure for land, as are the cakes of linseed, rape, and some others, after the oil has been squeezed out of them. The green husks boiled, without any mixture, it is said, make a good colour for dying a dark yellow; and that the kernel rubbed upon any crack or chink of a leaky vessel, will stop it better than either clay, pitch, or wax.

These trees may, of course, be said to be doubly profitable, as in their annual crops of fruit, while growing, and in their timber, when felled or cut down.

The nuts are the best preserved, for planting and raising the trees, in some sort of dry sandy material; and advantage is said to be gained, in rendering the trees more early productive, by such means as prevent their roots from running too much downwards.

In the intention of preserving and using the nuts or fruit as seed, they should be left upon the trees until they be perfectly ripe, which is shewn by the outer husks easily separating from the nuts, and by these husks occasionally opening and letting the nuts drop out. It is usually about the latter end of September. In trees of large growth, the nuts are usually beaten down by long poles, as it would be difficult and troublesome to gather them by the hand; but it should not be done with such violence as is commonly used, from the mistaken notion that the trees are thereby improved, as most certainly they cannot be benefitted by such a rough manner of forcing off the young wood, upon which this fruit mostly grows at the extremities of the branches. As soon as gathered, they are to be laid in heaps a few days to heat and sweat, to cause the complete separation of the husks, then be cleaned from the rubbish that hangs about them, and be deposited in a dry room for use, covering them well with dry straw, when they will keep some months.

Walnuts are always of ready sale in the markets of large towns, in which, at their first coming in, they are commonly bought with their husks on, and sold by the sack or bushel, but afterwards cleaned, and disposed of both by measure and the thousand.

The ordinary length of time required for the walnut to bear well, when raised from the nut or seed, is mostly about twenty years.

WALO, in *Geography*, a town of Sweden, in the province of Upland; 30 miles N.E. of Upsal.

WALOM, a town of Hindoostan, in Guzerat; 16 miles S. of Puttan.

WALOON, or WALLOON, a kind of old French; being the language spoken by the Walloons, or the inhabitants of a considerable part of the French and Austrian Low Countries; *viz.* those of Artois, Hainault, Namur, Luxemburg, and part of Flanders and Brabant.

The Waloon is held to be the language of the ancient Gauls, or Celts.

The Romans, having subdued several provinces in Gaul, established prætors, or proconsuls, &c. to administer justice in the Latin tongue. On this occasion, the natives were brought to apply themselves to learn the language of their conquerors; and thus they introduced abundance of the Roman words and phrases into their own tongue.

Of this mixture of Gaulish and Latin was formed a new language, called Romans; in contradistinction to the ancient unadulterated

unadulterated Gaulish, which is called Waloon, or Walloon. This distinction is kept up to this day; for the inhabitants of several of the Low-Country provinces say, that in France they speak Romans; whereas they speak the Walloon, which comes much nearer the simplicity of the ancient Gaulish.

WALOUGA, in *Geography*, a town of Africa, in the country of Whidah; 10 miles N. of Sabi.

WALPACK, a town of the state of New Jersey, in the county of Sussex, containing 591 inhabitants; 25 miles W.N.W. of Morristown.

WALPERSDORFF, a town of Austria, on the Trasen; 4 miles N. of St. Polten.

WALPING SEE, a lake of Prussia, in the province of Ermeland; 4 miles S.W. of Allenstein.

WALPIT, a town of France, in the department of the Lis; 3 miles N.N.E. of Courtray.

WALPO, or WALPON, a town of Sclavonia, which gives name to a county, situated on a river which runs into the Drave, defended by an ancient castle; 20 miles N.W. of Eszek.

WALPO *Taro*, a rock in the Spanish Main, near the Mosquito shore. N. lat. 14° 30′. W. long. 82° 40′.

WALPOLE, ROBERT, in *Biography*, earl of Orford, the third son of Robert Walpole, esq., was born at Houghton in Norfolk, the seat of his father, in August 1676, received his preparatory instruction at Eton, and completed his course of education at King's college, Cambridge; being distinguished at school for his talents for public speaking, and at the university by the ardour of his attachment to Whig principles. He was originally designed for the church; but his views were changed by the death of his eldest surviving brother in 1698, and he was initiated in the habits and pursuits of a country gentleman. In 1700 he married a lady, whose fortune enabled him to clear the incumbrances of an estate of 2000*l.* a year, which came into his possession after his father's death, and in this year he became an active member of parliament in connection with the Whig party, as a representative of the borough of Castle Rising. In queen Anne's first parliament, 1702, he was returned for Lynn, and continued to represent that borough till he became a member of the house of peers. Having availed himself of two or three opportunities which occurred for gaining the esteem and confidence of his party, he was appointed by the Whig administration in 1708 secretary of war, which office he held for a short time in connection with that of treasurer of the navy. After the trial of Sacheverel, which issued unfortunately, he published a pamphlet, in which he fixed the stigma of Jacobitism on the abettors of that turbulent priest. Upon the dismissal of the Whig ministry, he resigned his office; but having provoked the displeasure of the ruling party by his spirited defence of lord Godolphin, he was charged with venality and corruption, while he held the place of secretary at war, expelled the house, and committed to the Tower in January 1712. During his confinement, he was regarded as a martyr to the Whig cause, and visited by several persons of distinction; and he employed himself in writing a pamphlet in his own vindication. After his release in July, though he could not take his seat, he served his party by his counsel and by his pen. The dissolution of parliament took place in 1713; and Walpole was induced to expose the measures of the Tory ministry by a pamphlet, intitled "A short History of the Parliament," to which he affixed the motto, "Venalis populus, Venalis Curia Patrum." Being returned again for Lynn in February 1714, he was active in opposing the queen's Tory ministry; and particularly distinguished himself by a speech in favour of Steele, who was prosecuted by the house for two publications. Towards the close of this reign, he displayed great zeal for the Protestant succession in the house of Hanover. Upon the death of the queen in August 1714, and the accession of George I., a new Whig ministry was formed: and Walpole was recompensed for his sufferings and losses by the two lucrative places of paymaster of the forces, and of Chelsea Hospital. He was actively employed in connection with lord Townshend, principal secretary of state, who had married his sister; and became chairman of the secret committee appointed to inquire into charges against the late ministers, and moved the impeachment of lord Bolingbroke. Being a zealous supporter of government in the rebellion of 1715, he was advanced to the important posts of first lord of the treasury and chancellor of the exchequer. Although illness prevented his supporting the septennial bill in parliament, he was decidedly attached to the measure. During the divisions that afterwards occurred in the cabinet, he steadily maintained his connection with lord Townshend, and on his dismission in 1717, resigned his office; and even joined the Tories in opposing measures, for which, as a minister, he would have been an advocate. He contributed by a speech delivered on the occasion to the rejection of the peerage bill in 1719, and he opposed in 1720 the South-sea scheme for the liquidation of the national debt. Lord Townshend and Walpole received overtures from the earl of Sunderland, whose ministry was embarrassed, and a partial coalition was effected, in consequence of which the latter was restored to the post of paymaster of the forces. He had previously effected a reconciliation between the king and the prince of Wales, between whom a variance had long subsisted. To him the public attention was directed during the disasters that succeeded the failure of the South-sea scheme in 1721; an event which served to displace lord Sunderland from the post of first lord of the treasury, in which Walpole was re-established. At this time he adopted measures for advancing the trade and manufactures of the country, which have been much applauded by dean Tucker. In 1722 a new parliament assembled, in which the Whigs composed a majority; and Walpole distinguished himself in the prosecution of bishop Atterbury for his plot in favour of the pretender, which terminated in the banishment of this prelate. In recompence of his services, which were such as not to allow his removal from the house of commons, his son was made a baron. His brother, Horace Walpole, was appointed minister to the court of France, and he was honoured with being nominated knight of the garter. Sir Robert Walpole was at this time prime minister. In 1725 he promoted the bill for restoring lord Bolingbroke to his country and estate, though his attainder was still subsisting; and this partial benefit gave such offence to his lordship, that he became a powerful antagonist to Walpole's administration. His pacific measures highly recommended him both to the nation and the king; but the death of his majesty in 1727 occasioned changes that are generally incident to a new reign. Walpole was no favourite with George II., but the influence of queen Caroline prevailed against the intrigues of both Pulteney and lord Bolingbroke, and when he was considered as a fallen minister, re-established in the offices of first lord of the treasury and chancellor of the exchequer, with a greater degree of power than he had ever before possessed. Of course his deserted levees were crowded with those who bask in the sun-shine of court favour. Walpole, however, was assailed by a host of able and active adversaries; among whom were Pulteney at the head of discontented Whigs, Sir William Wyndham and the Tories,

and

and a group of Jacobites. For ſelf-defence, when argument, which derived every poſſible advantage from his eloquence, failed, he had recourſe to the more powerful influence of corruption; and this latter mode of conviction which he not only practiſed from neceſſity, but ſyſtematically vindicated and recommended, gave a diſtinguiſhing character to his adminiſtration, and entailed reproach on his memory. In order to ſecure the favour of the court, he augmented the civil liſt, and obtained for queen Caroline a jointure of 100,000*l.* Soon after, *viz.* in 1730, the differences with the court of Spain were terminated by the treaty of Seville in 1729, but Townſhend, diſguſted by the ſuperiority which his kinſman Walpole was aſſuming, reſigned his office of ſecretary of ſtate, and withdrew from public buſineſs with dignity and honour. In the year 1733, Walpole propoſed two meaſures of finance, which occaſioned much oppoſition and clamour; one was the alienation of the ſinking fund, and the other the introduction of the exciſe; but notwithſtanding the diſſatisfaction produced by theſe meaſures, and by his diſappointing expectations which he had encouraged the Diſſenters to indulge with regard to the repeal of the Teſt Act, the miniſter maintained his ground; and ſucceeded in his endeavours for preſerving peace with foreign nations. The diſagreement between Frederick prince of Wales and his father was the ſource of much uneaſineſs and trouble, and theſe were aggravated by the death of queen Caroline, who had been long attached to him, and ſupported his intereſt with his royal maſter. Differences that occurred between this country and Spain, on account of the commerce in South America, was the occaſion of additional anxiety; and though he much wiſhed for the continuance of peace, the diſcontented party prevailed, and in 1739 war was declared againſt Spain. With a mind thus agitated, and contending with a powerful oppoſition, he ſought leave to reſign, but the king would not conſent. At length, *viz.* in 1740, a motion was made in the houſe of commons for his removal from the king's preſence and councils; but though it was then negatived, the clamour againſt him increaſed; and loſing the ſupport of the houſe, he was created earl of Orford in February 1742, and reſigned. He ſucceeded, however, by his influence, in forming a Whig miniſtry, at the head of which was Pulteney. His conduct during his adminiſtration became the ſubject of parliamentary inquiry, but his enemies could not prevail againſt him; and he ſo far retained his majeſty's regard and confidence, as to be conſulted by him, and to adviſe Pelham to be placed at the head of the treaſury. Having long been afflicted with calculous complaints, which were aggravated by a journey from Norfolk to London, by command of the king in November 1744, he was obliged to recur for temporary relief to large doſes of opium; but after a diſplay of extraordinary fortitude and reſignation during the progreſs of his ſevere diſorder, it terminated in his death, on March 18th, 1745, in the 69th year of his age. As to his political character, one of his biographers ſays, "that the deſire of preſerving peace abroad, and avoiding all ſubjects of contention at home, and promoting gradual improvements in the trade and finances of the country, and purſuing uſeful rather than ſplendid objects, joined with a ſincere zeal for the Proteſtant ſucceſſion, were the leading principles of his government; and the means which he employed were prudence, moderation, vigilance, and, it muſt be allowed, corruption, though it may well be doubted whether he left public men more corrupt than he found them." As a man of buſineſs, he was methodical and diligent; and, accordto lord Cheſterfield, "an artful rather than an eloquent ſpeaker;" and more a man of ſound ſenſe and quick diſcernment than of genius. In private life, he is ſaid to have been good-humoured, eaſy and agreeable in his temper, frankly familiar in his manner, and of courſe much eſteemed by his friends and conciliatory to his enemies. His manners, however, were inelegant, his mirth coarſe, his converſation and morals licentious, acceſſible to flattery, and the eaſy dupe of women. In his domeſtic relation, he was kind and benevolent; but he neither loved nor patronized literature. Coxe's Memoirs of Sir Robert Walpole. Gen. Biog.

Walpole, Horace, lord Orford, the youngeſt ſon of the preceding nobleman, was born in 1718, and educated firſt at Eton and afterwards at King's college, Cambridge, where he wrote "Verſes in Memory of King Henry VI." dated in 1738. Having been nominated on leaving the univerſity to ſome patent ſinecure places, he commenced his tour to the continent in 1739, in which he was accompanied by Gray, from whom he parted, as he candidly acknowledges, by his own fault, and to whom in 1744 he was reconciled. His moſt intimate friend, however, was his natural couſin, general Seymour Conway, to whom he was attached from his youth, and with whom he correſponded from 1740 to 1795, the year of the general's death. His firſt appearance in parliament was in 1741, as a repreſentative for Callington. But more attached to literature and the arts than to the occupations of public life, and unambitious of obtaining any emoluments beſides thoſe which his places afforded him, or any rank and ſtation connected with political purſuits, he rather choſe to retire from the world than to take an active part in parliamentary buſineſs. On all occaſions, however, he manifeſted his ſteady adherence to thoſe Whig principles which he had imbibed from his youth, and his conduct as a member of the legiſlature was always pure and independent. Having, in 1748, purchaſed a ſmall houſe at Twickenham, called Strawberry-hill, he devoted his time and attention to the improvement of it in the Gothic ſtyle of architecture; and to the furniſhing of it with ſuch a collection of books, pictures, and other ſpecimens of the fine arts, as made it a very deſirable place of reſort in the vicinity of the metropolis, and he gratified the public curioſity and taſte by appropriating three hours a day in the ſummer months for the accommodation of viſitors. In this ſingular and intereſting manſion, he amuſed himſelf with the cultivation and exerciſe of his literary talents by contributing ſome papers to a periodical publication, entitled "The World;" by his "Catalogue of Royal Noble Authors," printed by his own preſs; and by a collection of his "Fugitive Pieces;" by his "Anecdotes of Painting in England," publiſhed in 1761, in 2 vols. 4to., to which he afterwards added two more volumes; by a political pamphlet on general Conway's diſmiſſion from the army for his vote in parliament on general Warrants, which appeared in 1764; and tale of the "Caſtle of Otranto," publiſhed in 1765. During his viſit at Paris in 1765, he provoked the reſentment of the irritable Rouſſeau, by addreſſing to him a letter in the name of the king of Pruſſia, expoſing his vanity and ſelf-conceit. This letter was afterwards printed, and led Rouſſeau to ſuſpect, that this was part of a concerted plan to ruin his reputation, and that Hume and the French philoſophers had contrived it for this purpoſe. Walpole was juſtly cenſured for the part he took in this buſineſs; nor could his beſt friends vindicate him for the contemptuous treatment with which he treated thoſe who were authors by profeſſion. In 1767 Walpole withdrew from public buſineſs, and declined a return for the borough of Lynn in the enſuing parliament. Soon afterwards he publiſhed his "Hiſtoric Doubts on the Life and Reign of King Richard III." In 1768, he printed at his own preſs his tragedy of the "Myſterious

terious Mother;" and about the same time he was concerned in the transactions that occurred between him and the unfortunate Chatterton. In 1791 the death of his nephew elevated him to the rank and title of earl of Orford; but this circumstance requiring some change in his fixed habits, gave him rather uneasiness than satisfaction. Towards the close of his life he was much afflicted with a constitutional gout, by which he was much debilitated; and yet he attained to his 79th year, quietly expiring in March 1797. His printed and MS. writings, of which an edition was published in 1798 in 5 vols. 4to., were bequeathed to Robert Berry, esq. and his two daughters. A posthumous work, *viz.* "Letters from the Hon. Horace Walpole, Esq. to George Montague, Esq. from the Year 1736 to 1770," royal 4to. has been published.

Although Horace Walpole, as to the habits of his life, was more inclined to personal enjoyment than to social intercourse, his disposition was affectionate, and he was occasionally generous to his friends. Although he was not profoundly learned, he encouraged literature and the arts by his own writings, and by various domestic arrangements and conveniences adapted to this purpose. Nichols's Lit. Anecd. Walpole's Works. Gen. Biog.

WALPOLE, in *Geography*, a town of New Hampshire, in the county of Cheshire, on the Connecticut, containing 894 inhabitants; 76 miles N.W. of Boston.—Also, a town of the state of Massachusetts, in the county of Norfolk, containing 1098 inhabitants; 21 miles S.W. of Boston.

WALPUSCH, a river of Poland, which runs into the Narew, near Pultusk.

WALRABENSTEIN, a town of Germany, in the principality of Nassau Weilburg; 3 miles N. of Idstein.

WALRING, a town of the duchy of Wurzburg; 4 miles N.W. of Melrichstadt.

WALRUS, in *Zoology*, the name by which some authors call the morse, or sea-horse, called also by others *rosmarus*, a creature very different from the hippopotamus, or river-horse. See MORSE.

WALSALL, in *Geography*, an ancient market-town in the south division of the hundred of Offlow, in the county of Stafford, England, is situated on an eminence at the distance of 16 miles S.E. by S. from the county-town, and 126 miles S.W. from London. It is a place of remote antiquity, and is regarded as the second town in the county. The civil government is vested in a mayor, recorder, twenty-four aldermen, and a town-clerk: the mayor, late mayor, and senior aldermen, are in the commission of the peace, and regularly hold quarter-sessions. According to the return of the year 1811, the inhabitants of the town amounted to 5541, occupying 1150 houses, which are disposed in twelve streets. The manufacture chiefly carried on here is that of buckles, spurs, stirrups, and in general all sorts of hardware articles connected with sadlery. A well-supplied market is held on Tuesdays; and three fairs annually for horses, cattle, cheese, and bacon. A remarkable custom, mentioned by Dr. Plot, still prevails here: on the eve of Epiphany, a gift of one penny is regularly distributed to every person residing in the town, or in the villages thereto belonging; not only to the fixed inhabitants, but to all strangers who may happen to be there. This was an ancient endowment of an inhabitant of the name of Morley. The church is a very ancient edifice, of a cruciform construction. At the south-west angle rises a strong, plain tower, surmounted by an octagonal spire. The interior is lofty and spacious, and presents a singular appearance: each side of the chancel has seven stalls, the seats of which are ornamented with a great variety of grotesque figures carved in basso-relievo. Under this part of the church is an archway of massy workmanship, forming a common passage through the eastern division of the church-yard. Here are also several places of worship appropriated to various classes of dissenters: and a free grammar-school founded by queen Elizabeth.

This parish includes the *foreign of Walsall*, a district comprehending the hamlets of Great Bloxwich, Little Bloxwich, Caldmoor, Little London, and the Windmill. In the year 1811, the population of this district was stated to be 5648; the number of houses 1099: making the inhabitants of the whole parish 11,199; the houses 2249.

About a mile and a half to the north of Walsall is *Rushall-Hall*, the seat and park of the Rev. W. Leigh.—Bescot-Hall is one mile from the town, and occupies the scite of the ancient baronial mansion of the Hillarys and Mountfords: it is surrounded by a moat, over which is a picturesque bridge: the iron-gates, formerly standing close to the house, are now placed at a considerable distance, greatly improving the approach. — Beauties of England and Wales, vol. xiii. Staffordshire.

WALSCHIED, a town of France, in the department of the Meuse; 6 miles S.E. of Sarburg.

WALSDORF, a town of Germany, in the principality of Nassau; 3 miles N.E. of Idstein.—Also, a town of Bavaria; 4 miles W. of Bamberg.

WALSEE, a town of Austria, on the Danube; 14 miles E. of Ens.

WALSH, WILLIAM, in *Biography*, was born at Abberly in Worcestershire in 1663, and having finished his education as gentleman-commoner of Wadham college in Oxford, he travelled abroad for further improvement, and after his return attracted notice as a man of letters and of fashion. He also assumed a political character, and represented his native county in parliament, and distinguished himself by actively promoting the Revolution. He is supposed to have died in 1709. Dryden, with whom he cultivated friendship, repaid his attentions with that praise which he was disposed liberally to bestow on those whom he wished to distinguish, denominating him "the best critic of our nation," and he furnished a preface to his "Dialogue concerning Women." Pope also acknowledges early obligations to him in the following terms:

"And knowing Walsh would tell me I could write."

In his "Essay on Criticism," he denominates him the "Muse's judge and friend," and with the ardour of youth, gives him the credit of having "taught his early voice to sing." It has been observed, however, that Mr. Walsh's rank in the scale of literature scarcely entitled him to the high panegyric either of Dryden or of Pope; for neither his miscellaneous poems, nor his prose pieces, of which one was his "Essay on Pastoral Poetry," justify the very distinguished honour which they conferred upon him. Biog. Brit. Johnson's Lives of the Poets. Gen. Biog.

WALSH, JOHN, opened a music-shop in Catherine-street in the Strand, 1710; and was the first in our country who stampt music on pewter. He was succeeded by his son, who was Handel's publisher; the publisher of Corelli, and of the solos and concertos of Geminiani. Indeed he and Huse in the city, seemed for a long time to monopolize the sale of music throughout the kingdom; till Johnson of Cheapside, who attended all the great fairs in the kingdom, and Bremner from Edinburgh, opened a shop in the Strand, and became extensive publishers, and formidable rivals to Walsh and his successor and relation, Randal.

The Dutch, during the whole last century, engraved or stampt music on copper, superior to the natives of all other countries. The only engraver in that metal in our own country

country was Cluer in Bow church-yard, who engraved in 8vo. several of Handel's operas in score, in the neatest and most correct manner which we remember to have seen, particularly Julius Cæsar, in 1720, which we keep as a curiosity.

WALSH, in *Agriculture*, a term provincially applied in some cases to the peculiarly insipid taste of some vegetables, roots, and other such substances.

WALSH, *Cape*, in *Geography*, a cape on the coast of New Guinea. S. lat. 8° 24'. E. long. 137°.

WALSHAM, NORTH, a market-town in the hundred of Tunstead and county of Norfolk, England, is situated in a level near the sea, at the distance of 15 miles N.N.E. from Norwich, and 124 miles N.E. by N. from London. In the year 1600, a destructive fire occurred here, which consumed 118 houses, besides many barns, stables, malt-houses, &c.; the value of which was estimated at 20,000*l*. The town now consists of three streets, which form an irregular triangle. At the junction of these is the parish-church, the tower of which fell down in 1724. In the chancel is a fine monument, with an effigy, &c. to the memory of sir William Paston, knt., who died in 1608, aged eighty years. He agreed, in 1607, with John Key, a mason of London, to erect and fit up this tomb, with his effigy in armour, five feet and a half long, for which he was to pay 200*l*. Sir William settled 40*l*. *per annum* on the free-school, and 10*l*. a year on a weekly lecturer. In this parish are meeting-houses for Quakers, Methodists, Presbyterians, and Anabaptists. An annual fair is held here, and a weekly market on Thursday. In the reign of Edward VI. bishop Thirlby built a market-cross here, which, being damaged by the fire above mentioned, was repaired by bishop Redman. In the population return of the year 1811, this parish is stated to contain 448 houses and 2035 inhabitants.

In the adjacent parish of Bacton stood *Broomholme Priory*, founded by William de Glanville, in 1113, for monks of the Cluniac order; the remains of this building, near the sea-side, some time since formed an interesting ruin; but most of the walls are now incorporated with a farm-house, and the rooms converted into domestic offices.

St. Bennet's Abbey, at *Holme*, in the parish of Horning in this hundred, was founded in a fenny place, called Cowholme, where formerly was an hermitage, which king Canute, in the year 1020, established for black monks of the Benedictine order. The ample endowments first granted were further extended by Edward the Confessor, the empress Maud, and other royal personages. It was one of the mitred abbeys, and its abbots had a seat in the house of lords. This abbey was so strongly constructed, that it appeared more like a castle than a cloister; and was so well fortified, that William the Conqueror in vain besieged it, till a monk, on promise of being made abbot, betrayed the place: the king performed the condition, but hanged the new abbot as a traitor. Some foundations of the walls, which inclosed an area of thirty-five acres, are yet traceable; but the remains of the once-stately building are now no more, except part of the magnificent gate-way, and this is partially obscured by a draining-mill erected over it.—Beauties of England and Wales, vol. xi. Norfolk. By J. Britton, F.A.S. 1810, from Blomefield's History, &c. of Norfolk.

WALSINGHAM, *Sir* FRANCIS, in *Biography*, an eminent statesman, was descended from an ancient family of Walsingham in Norfolk, and born at Chislehurst in Kent. Having completed his education at King's college, Cambridge, he sought farther improvement by foreign travels, and having remained abroad during the reign of queen Mary, he was introduced to public business by Cecil on his return to his own country. He commenced his political career as ambassador to France, where he continued, discharging his public duties with great assiduity and injury to his own fortune, until the year 1573. His conduct in this office is highly commended by Wicquefort; and Dr. Lloyd, in his "State-Worthies," pronounces a very flattering eulogy on his political character. In 1573 he was appointed secretary of state, admitted into the privy-council, and knighted; and such was his vigilance in guarding against plots which threatened to disturb the tranquillity and security of queen Elizabeth, that he is said to have maintained 53 agents and 18 spies in foreign courts. In 1581 he went to France as ambassador for the purpose of treating concerning a marriage between Elizabeth and the duke of Anjou; and on this occasion, it is said, that "the fickle coquetry of his mistress tried his patience, and exercised all his diplomatic dexterity." The result of his embassy to Scotland in 1583 was a report of James's abilities and learning more favourable than he really merited. In the unhappy dispute that terminated in the execution of Mary, Walsingham was a principal agent, and he has been charged, as the reader will find under the article ELIZABETH, with recommending some private method of putting that unfortunate princess to death; but it has been thought that the letter mentioned under that article, and said to have been signed by him, is not genuine; and that this is the case is rendered more probable by the evidence alleged in proof of Walsingham's having warmly opposed such an act of villainy when proposed by the earl of Leicester. After the death of Mary, Walsingham was principally instrumental in producing a reconciliation between the English and Scottish courts. This minister was a zealous Protestant, and seemed disposed to countenance the Puritans, as the most zealous opponents of popery; and he also manifested his attachment to the reformed religion by establishing a divinity-lecture at Oxford in 1586, for the purpose of discussing the fundamental truths of Christianity, derived from the scriptures, and of thus forming a wider separation between the church of England and that of Rome. In advanced life, Walsingham retired from business; and died in April 1590, so much in debt, notwithstanding the various posts and dignities which he occupied, that he was buried in St. Paul's privately and by night, lest his body should be arrested. His poverty, however, seems to have been exaggerated, though his expences in the conduct of public business were known to be very great. His only daughter was successively married to sir Philip Sidney, to the earl of Essex, and to the earl of Clanrickard. The negotiations and dispatches of Walsingham, during his residence at the French court in 1570, were collected by sir Dudley Digges, and published in 1655, fol. Biog. Brit.

WALSINGHAM, THOMAS, a native of Norfolk, was a benedictine monk of St. Alban's, where he was chanter, and probably regius professor of history about the year 1440, in the reign of Henry VI., as he styles himself historiographer royal. One of his works is intitled "Historia brevis," and commences with the close of the reign of Henry III., where that of Matthew Paris terminates. Another performance is intitled "Hypodigma Neustrie," and gives an account of the affairs of the duchy of Normandy, from the time of Rollo to the sixth year of Henry V. The materials of this chronicler's narratives are in good estimation; and were published by archbishop Parker, Lond. 1574, fol. Nicolson's Hist. Lib. Gen. Biog.

WALSINGHAM, THOMAS, in the *History of Music*, was the author of a treatise in the MS. of Waltham Holy Cross; for an account of which, see *Lionel* POWER. For an account of Walsingham's treatise, see the article PROLATION.

Walsingham, a tune in queen Elizabeth's Virginal Book, with thirty variations by Dr. Bull; fo difficult, that the famous finger, Margarita, after fhe had quitted the ftage, and was married to Dr. Pepufch, though fhe became a great harpfichord player, could never entirely conquer them. See Virginal *Book* of queen Elizabeth and *Dr.* Bull.

We at firft imagined that this tune might have had its name of Walfingham, from the compofer of whom we have been fpeaking in the preceding article; but find that in Ward's Lives of the Prof. of Gres. Coll. it is faid to have been firft compofed by Birde, with twenty variations, and that Bull compofed his variations at different times. Afterwards, we thought then that the name might have been a compliment to fir Francis Walfingham, the queen's minifter; but that idea was relinquifhed on finding that it was the tune of an old fong, beginning, "As I went to Walfingham," in queen Elizabeth's book; and "Have with you to Walfingham," in lady Nevil's virginal book, where it is inferted with twenty-two variations by Birde. Now it is well known by tradition, in Norfolk, that Henry VIII., previous to the fuppreffion of the monafteries, vifited that of our lady of Walfingham, fo rich in votive gifts from thofe who had been cured of difeafes, or imagined themfelves cured, by the waters of the holy well, that it has been fuppofed that Henry, tempted by the riches and fplendour of the religious houfes at Walfingham, precipitated their fall; and it is probable, that the words to the tune called Walfingham were written about this time.

Walsingham, *Little*, or *New*, in *Geography*, a confiderable market-town in the hundred of North Greenhoe and county of Norfolk, England, is fituated on the banks of a fmall river at the diftance of 29 miles N.W. from the city of Norwich, and 114 miles N.N.E. from London. The great celebrity which this town obtained for feveral centuries was originally derived from the widow of Ricoldie Faverches founding, about the year 1061, a fmall chapel in honour of the Virgin Mary, fimilar to the Sancta Cafa at Nazareth. Sir Geffrey Faverches, her fon, confirmed the endowments, made an additional foundation of a priory for Auguftine canons, and erected a conventual church. Immenfe wealth was accumulated by grants and offerings; and the image of the *Lady of Walfingham* was as much frequented, if not more than the fhrine of St. Thomas à Becket at Canterbury. Foreigners of all nations came hither on pilgrimage; many kings and queens of England alfo paid their devoirs to it; fo that the number and quantity of her devotees appeared to equal thofe of the lady of Loretto in Italy. Erafmus, who vifited this place, fays, that "the chapel, then rebuilding, was diftinct from the church, and infide of it was a fmall chapel of wood, on each fide of which was a little narrow door, where thofe who were admitted came with their offerings and paid their devotions; it was lighted up with wax torches, and the glitter of gold, filver, and jewels, would lead you to fuppofe it to be the feat of the gods." This far-famed image was, in the 30th year of Henry VIII., conveyed to Chelfea, and there publicly burnt. The prefent remains of this once-noble monaftic pile are, a portal, or weft entrance gateway, a richly ornamented lofty arch, fixty feet high, which formed the eaft end of the church, fuppofed to have been erected in the time of Henry VII.; the refectory, feventy-eight feet long, and twenty-feven broad, and the walls twenty-fix feet and a half in height; a Norman arch, part of the original chapel, which has a zigzag moulding; part of the old cloifters, a ftone bath, and two wells, called the Wifhing Wells, from a charm which fuperftition attached to them. The principal parts of thefe venerable ruins are included in the pleafure-grounds of Henry Lee Warner, efq. who has a commodious houfe, which occupies the fcite of the priory. The prefent proprietor has progreffively, for feveral years, been making improvements in planting, and laying out the grounds in the immediate vicinity of his manfion. The church of Walfingham is a fpacious and interefting pile, difplaying in its architecture, ornaments, monuments, and very elegant font much to gratify the antiquary. The latter is not only the fineft fpecimen of the fort in the county, but perhaps in the kingdom. It is of an octangular fhape, and the whole of its bafe, fhaft, and projecting upper portion, is covered with fculpture, reprefenting buttreffes, pinnacles, niches, crocketted pediments, &c. with feveral figures in baffo-relievo. It is elevated on a plinth of four fteps, the exterior faces of which are alfo decorated with tracery mouldings. (See an account and view of it in Britton's Architectural Antiquities of Great Britain.) A houfe of grey friars was founded in this town about the year 1346 by lady Elizabeth de Burgh, countefs of Clare; but its fame was eclipfed by the fuperior grandeur of its neighbour, and poverty thruft it ftill further into obfcurity. An hofpital for lazars was founded here in 1492: the building of which is ufed now as a bridewell. A fair is held annually; and a market weekly on Fridays. The population, by the return of the year 1811, was ftated to be 1008, occupying 236 houfes.

At the diftance of a mile and a half N. by E. is the village of Old Walfingham, which contains two churches; and in 1811 was returned as having 71 houfes, and a population of 347 perfons.

In the adjoining parifh of Binham are the remains of Binham Priory, formerly an edifice of great extent and liberal endowment. Its ruins are now very confiderable and interefting, but are gradually mouldering away. Of the once-fpacious collegiate church, only the nave and north aifle, the chief part of the weftern front, and fragments of the tranfept, are now left. Excepting the weft façade, the whole is of the early Norman architecture, and moft probably conftitutes part of the original ftructure founded in the beginning of the reign of Henry I. The exterior of the weftern front is wholly in the pointed ftyle, and is an interefting fpecimen of the ecclefiaftical architecture of the thirteenth century.

Holkham Houfe, in the adjacent parifh of Holkham, the magnificent feat and refidence of Thomas William Coke, efq., was begun in the year 1734 by the earl of Leicefter, and completed by his dowager-countefs in 1760. The central part of this fpacious manfion extends three hundred and forty-five feet in length, by one hundred and eighty in depth, and is accompanied by four wings or pavilions, which are connected with it by rectilinear corridors or galleries; each of the two fronts, therefore, difplays a centre and two wings. In the centre are comprifed the principal rooms; and each wing has its refpective deftination, and fuite of family apartments. There may be houfes larger and more magnificent than this, but fcarcely any one in the kingdom that can equal it for convenience and appropriate arrangement. The fitting up of the interior is in the moft fplendid ftyle, and in fome of the apartments with the moft elegant tafte. A correfponding ftyle prevails in laying out the extenfive pleafure-grounds and park. On the north fide of the latter, a lake, covering about twenty acres, extends in nearly a right line for 1056 yards; it includes a fmall ifland, and the fhore is finely clothed with wood.—Beauties of England and Wales, vol. xi. Norfolk. By J. Britton, F.A.S. 1810. Blomefield's Topographical Hiftory of Norfolk, vol. ix. 8vo. 1808.

Walsingham *of Davis, Cape*, a cape on the E. coast of America, at the N. side of the entrance into Cumberland straits. N. lat. 64° 10′. W. long. 66°.

Walsingham *of Frobisher, Cape*, a cape at the S.E. extremity of Hale island in Davis's straits, at the entrance of Frobisher's straits. N. lat. 62° 50′. W. long. 64° 58′.

WALSRODE, *i. e.* Walo's Cross, a town of Westphalia, in the principality of Luneburg Zell, on the Bolme. It owes its rise to a monastery founded in 986, by Walo a prince of Anhalt, and is now a considerable town with a good trade in wool, beer, &c.; 3 miles N.W. of Zell. N. lat. 52° 54′. E. long. 9° 35′.

WALSTORP, a town of the duchy of Holstein; 11 miles S.W. of Lutkenborg.

WALT, in *Sea Language*, an obsolete or spurious term, signifying crank.

WALTDORF, or Waltersdorf, in *Geography*, a town of Silesia, in the principality of Neisse; 5 miles N.N.E. of Neisse.

WALTENBUCH, a town of Wurtemburg; 8 miles S. of Stuttgart.

WALTER Nienburg, a town of Germany, in the principality of Anhalt Zerbst; 6 miles W. of Zerbst.

WALTERSDORF, a town of Bohemia, in the circle of Chrudim; 13 miles N.E. of Leutmischl.

WALTERSDORFF, a town of Austria; 5 miles E. of Zisterdorff.

WALTERSHAUSEN, a town of Germany, in the principality of Gotha; 4 miles S.S.W. of Gotha. N. lat. 50° 56′. E. long. 10° 38′.

WALTERSKIRCHEN, a town of Austria; 8 miles N.W. of Zisterdorff.

WALTHAM, a town of Massachusetts, in the county of Middlesex, containing 1014 inhabitants; 11 miles N.W. of Boston.—Also, a town of Vermont, in the county of Addison, containing 244 inhabitants.

Waltham, or *Westham*, a town of Virginia, on the left bank of James river; 4 miles N.W. of Richmond.

Waltham *Abbey*, or Waltham *Holy-Cross*, a large irregular market-town in the half hundred of Waltham and county of Essex, England, is situated on low ground near the river Lea, at the distance of twenty-three miles W. by S. from Chelmsford, and twelve miles N. by E. from London. This spot was originally part of the forest of Essex, and derived the appellation of Waltham from the Saxon words *Ham*, a place, and *Weald*, woody; the whole scite being anciently overgrown with trees. The additional names were derived from the abbey afterwards founded here, and the cross to which the abbey was dedicated. The first mention of Waltham occurs in the reign of Canute the Great, when Tovy, the king's standard-bearer, founded here a village and a church, placing three score and six dwellers in the former, and two priests in the latter. After his death, Waltham reverted to the crown, and was granted, in 1062, by Edward the Confessor, to earl Harold, on condition that he should build a monastery there. Harold accordingly, in the same year, re-founded and enlarged the building erected by Tovy, and endowed it as a college for a dean and eleven secular canons of the order of St. Augustine. A distinct manor was assigned for the maintenance of each canon, and six for the support of the dean; the church was enriched with a great number of relics and costly vessels. The possessions of the college were afterwards considerably augmented by various benefactions, and it continued in a state of progressive advancement till the reign of Henry II. This monarch, by a charter of licence from pope Alexander, changed the old foundation of seculars into an abbey of regular canons of the same order, enlarging the number to twenty-four, and proportionably increasing their revenues; and the abbey and church were re-dedicated to the Holy Cross. Walter de Gaunt was appointed the first abbot, with an exemption by the pope from episcopal jurisdiction; and this privilege has descended to modern times, Waltham being still exempted from the archdeacon's visitation. Richard I. granted to the abbey the whole manor of Waltham, with various privileges and gifts, which were greatly augmented by Henry III., from whose time it became so distinguished by a series of royal and noble benefactors, as to rank with the most opulent in the kingdom. Henry frequently made the abbey his residence; and, to provide, in some measure, for the increased consumption which his presence and retinue occasioned, granted to the town the privilege of a weekly market, and an annual fair of seven days. The abbey having existed during the government of twenty-seven abbots, exclusive of the deans of the first foundation, was dissolved in the year 1539; when its annual revenues were valued at 900*l.* 4*s.* 11*d.* according to Dugdale; or, as recorded by Speed, at 1079*l.* 12*s.* 1*d.* The scite was granted to sir Anthony Denny; from whose family it passed in the next century, by marriage, to James Hay, earl of Carlisle: it has since been in the family of sir William Wake, bart. The abbey-house is said to have been a very extensive building; but it has been long since wholly demolished; a gateway into the abbey-yard, a bridge which leads to it, some ruinous walls, an arched vault, and the church, are now the only vestiges of the ancient magnificence of Waltham abbey. The church, which was of a much earlier style of architecture than the other remains, was built in the usual form of a cross, and consisted of a nave, transept, choir, ante-chapel, &c. Some idea may be formed of its great extent, from the situation of king Harold's tomb, which stood about 120 feet east from the termination of the present building, in what was then the east end of the choir: the intersection of the transept is still visible; above this rose the ancient tower, part of which falling through mere decay, the remainder was undermined and blown up, and the whole choir, tower, transept, and east end, were wholly demolished, so that nothing was left standing but the nave, which has since been fitted up, and made parochial, and constitutes the present church. This venerable relic, though much disfigured and mutilated, contains several interesting and curious specimens of the ornamented columns, semi-circular arches, and other characteristics of the Norman style of architecture. Its length is about ninety feet; and its breadth forty-eight. The body is divided from the aisles by six arches on each side; five are semicircular and decorated with zigzag ornaments; the sixth is pointed, and apparently of a later construction. At the west end is a heavy square embattled tower, rising to the height of eighty-six feet, and having the date of 1558. Almost every ornamental vestige of grandeur and antiquity, which formerly distinguished the exterior of this church, has been industriously defaced; and what remains owes its preservation to the durable nature of its materials. In the inside the hand of violence is less conspicuous; but every thing displays marks of the most wretched parsimony: the grandeur and simplicity of the ancient remains are much injured by white-washing; the brasses are torn from the grave-stones, and it is with difficulty that their impressions can be traced. In this church were interred king Harold and his two brothers, Girth and Leofwin, slain with him at the battle of Hastings. Many other persons of rank and authority in early times were also buried here. The history of Waltham town is so nearly identified with that of the abbey,

abbey, that but little remains to be said of the former. In the population return of the year 1811, the inhabitants of this town are enumerated as 2287; the houses as 422. Tuesday is the market-day, and here are now two annual fairs. The chief manufactures are those of printed linens, and of pins; for the latter purpose some large buildings have been recently erected, in which a great number of children of both sexes are employed. On one of the branches of the Lea, near the town, are some gunpowder mills, now in the occupation of government; these have been partly rebuilt since the year 1801, when considerable damage was done by the explosion of the Corning-house. The various streams of the Lea, in this vicinity, are traditionally supposed to flow in the same channels which the great Alfred made to divert the current, when he drew off the water, and left the Danish fleet on shore. Waltham parish includes the hamlets of Holyfield, Sewardstone, and Upshire, which are stated to contain 297 houses and 1398 inhabitants; making the aggregate population of the parish 3685, the number of houses 719.—Beauties of England and Wales, vol. v. Essex. By J. Britton and E. W. Brayley, 1803. History, &c. of Waltham Abbey, by J. Farmer, Gent. 8vo. 1735.

WALTHAM, *Bishop's*. See BISHOP'S *Waltham*.

WALTHAM, *West*, or WALTHAM *Cross*, a hamlet in the parish of Cheshunt, hundred and county of Hertford, England, is situated half a mile from Waltham abbey, nine miles S. by E. from Hertford, and twelve miles N. from London. It derives the appellation of *Cross* from one of those elegant stone crosses which Edward I. erected to the memory of his consort queen Eleanor, who died in November 1291, at Hareby near Grantham, in Lincolnshire. Her bowels were interred in Lincoln cathedral; her body was brought to London, and deposited in Westminster abbey. At each of the places where the procession rested, during this journey, the king afterwards erected a cross; of which only those of Geddington, Northampton, and Waltham, now remain. Waltham cross is the least perfect of the three, though the Society of Antiquaries have twice interested themselves in its preservation; once in 1721, and again in 1757, when lord Monson, then lord of the manor of Cheshunt, at the request of the Society, surrounded the base with brick-work: it was originally encompassed by a flight of steps, but these have been long removed. The upper parts are also greatly mutilated; much of the foliage is defaced, and the pinnacles and battlements are broken. The form of the cross is hexagonal: it is separated into three stories; the middlemost of which is open, and displays statues of queen Eleanor crowned; her left hand holding a cordon, and her right a sceptre or globe. Each side of the lower story is divided into two compartments, beneath an angular coping, charged with shields exhibiting the arms of England, Castile, Leon, and Ponthieu. The cornice over the first story is composed of various foliage and lions'-heads, surmounted by a battlement pierced with quatrefoils. The second story is formed of twelve open tabernacles, in pairs, terminating in ornamented pediments with a finial on the top: this story also finishes with a cornice and battlement like the first, and supports a third story of solid masonry, ornamented with single compartments in relief, somewhat resembling those below. In this hamlet is an ancient Spital, consisting of four rooms below, and three above, from time immemorial appropriated for poor lame people. The workhouse for the parish of Cheshunt is situated in this hamlet.—Beauties of England and Wales, vol. vii. Hertfordshire. By E. W. Brayley. 1808. Lysons' Environs of London, vol. iv. 4to. 1796. Britton's Architectural Antiquities of Great Britain, vol. i. 4to. 1807.

WALTHAM, *Great*, a township of England, in Essex 4 miles N. by W. of Chelmsford.

WALTHAM *on the Wold*, a town of England, in the county of Leicester, which had formerly a weekly market on Thursday, now discontinued; 18 miles S.E. of Nottingham. N. lat. 52° 50'. W. long. 0° 48'. See WALTON-*on-the-Wolds*.

WALTHAMSTOW, an extensive village in the hundred of Becontree and county of Essex, England, is situated near the borders of the river Lea, at the distance of six miles and a half N.E. by N. from St. Paul's cathedral, London. Its name is derived from the Saxon word *weald*, a wood, *ham*, a manor, and *stowe*, a place. It covers a considerable tract of ground, and is divided into the following streets, or hamlets: Wood-street, Clay-street, Marsh-street, Hoo-street, Hale-end, and Chapel-end. The parish church, a spacious brick structure, consists of a chancel, nave, and two aisles. At the west end is a square tower, which was rebuilt by sir George Monox, alderman of London; who also built the chapel at the east end of the north aisle about the year 1535: the south aisle was built about the same year with a part of some monies beqeathed for charitable uses by Robert Thorne, merchant-taylor, and citizen of London. About the year 1740, a meeting-house for Protestant dissenters was established in this village: in 1787 some disputes among the congregation occasioned the building of a new meeting-house, which was opened in July in that year: it has a cemetery adjoining. Sir George Monox, before mentioned, built and endowed thirteen alms-houses on the north side of the church-yard, for eight men and five women; with a school-house and apartments for a master: the endowments were augmented in 1686, by the will of Henry Maynard, esq. Thirty boys are now clothed and educated in the school; and the benefits have been extended to twenty girls, in a school established in 1780. Here is also a school for very young children, who are taken care of till of age to be admitted into the other schools. In the year 1795, six alms-houses were built and endowed by Mrs. Mary Squires, for widows of decayed tradesmen. The parish of Walthamstow contains about 4320 acres of land, of which upwards of 3000 are inclosed; chiefly pasture land. The population return of the year 1811 states the number of houses to be 562; the inhabitants 3777.—Lysons's Environs of London, vol. iv. 4to. 1796.

WALTHARN, a town of Hesse Darmstadt; 26 miles E.N.E. of Heidelberg.

WALTHAUSEN, a town of Austria, with a convent; 4 miles N.E. of Grein.

WALTHER, AUGUSTINE FREDERIC, in *Biography*, an anatomist and physician, was appointed in 1723 professor of anatomy and surgery, in the university of Leyden. Several of his dissertations on anatomical subjects are upon the whole commended, and have been reprinted by Haller. The best of his larger pieces are, "De Lingua Humana Libellus," 1724, 4to. As a botanist, he published a catalogue of the plants in his own garden, and a work on the structure of plants. He died about the year 1746. Haller. Eloy. See WALTHERIA.

WALTHER, BERNARD, an eminent astronomer, was born at Nuremberg in the year 1430, and having applied principally to the study of mathematics, and more especially of astronomy, under Regiomontanus, was eminently useful by his talents and opulence in encouraging the inventions and aiding the observations of his preceptor, whilst he continued at Nuremberg; and when by the invitation of pope Sixtus IV. he removed to Rome, with a view to the reformation of the calendar, he continued his observations for

nearly forty years, viz. from 1475 to the time of his death in 1504. His inſtruments were of the moſt perfect kind which he could then procure, and he was ſkilful and perſevering as well as ſucceſsful in the uſe of them. He was the inventor of a chronometer, or clock with wheels, which indicated the time of noon with an accuracy correſponding to the reſult of calculation; and he is alſo celebrated as the firſt of the Moderns who obſerved refraction. (See the article JOHN MULLER.) The ſingularity of his character, however, reſtricted the benefit which aſtronomy might otherwiſe have derived from his own obſervations and thoſe of his preceptor Regiomontanus, or John Muller. After the death of Muller, he purchaſed his papers and inſtruments, which he kept in his own poſſeſſion, without allowing any one to ſee them; and after his death, they were neglected by his heirs, ſo that many of them were loſt. At length the ſenate of Nuremberg purchaſed the writings of theſe two mathematicians which they could procure, and depoſited them in the library of that city. Several parts of them were afterwards extracted, and publiſhed by Schoner and his ſon. In the work entitled "Vranies Noricæ Baſis Aſtronomicæ, ſive Rationes motus annui ex Obſervationibus in Solem hoc noſtro et Seculo ab hinc tertio Norinbergæ, habitis, a Johanne Philippo a Wurzlebau," Norinb. 1709, are contained obſervations by Walther and Wurzelbau, with inferences drawn from a compariſon of them, which are ſaid by Käſtner to be very valuable, as the obſervations were made under the ſame meridian, and at the interval of a century. Montucla Hiſt. du Mathem. Käſtner Geſchite du Mathematik, cited in Gen. Biog.

WALTHER, JOHN GODFREY, author of an excellent hiſtorical and biographical muſical dictionary, publiſhed in German at Leipſic, 1782, in 8vo. The German title is: Muſicaliſches LEXICON oder Muſicaliſche Bibliothec. Of all the books which we have conſulted for information concerning muſicians and their works, we have never met with more ſatisfaction than from this Lexicon; which though compreſſed into an octavo volume, is ſo ample and accurate, that we have been ſeldom diſappointed, and never led into error by it. This little volume contains, not only all the technica of ancient and modern muſic, but biography, as far as names, dates, and works, of almoſt every eminent muſician that has exiſted in ancient and modern times, till the year in which the book was publiſhed. The author's information, of courſe, concerning Germany, is the moſt ample, but Italy and France have had a conſiderable ſhare of attention.

In 1790 and 1792 a new edition of this work, with additions to the time of publication, was printed at Leipſic in two vols. 8vo. by Ernſt Ludwig Gerber.

WALTHER, JOHN LUDOLPH, author of another very curious and uſeful dictionary, publiſhed at Ulm in folio, 1756, in Latin, intitled "Lexicon Diplomaticum Abbreviationes ſyllabarum et vocum in diplomatibus et codicibus a Seculo VIII. ad XVI. uſque occurentes exponens. Junctis Alphabetis et ſcripturæ Speciminibus integris." The author was librarian and private ſecretary to his Britiſh majeſty Geo. II. as elector of Hanover. With a very learned preface by John Harry Young, regius ſecretary in the univerſity of Gottingen.

The whole book is engraved on copper-plates; and in the ſecond part, among the ſpecimens of writing without abbreviations, we have examples of the firſt attempts at muſical notation from the ninth century, not only before lines were in uſe, but even before *points* of different elevation were the vocal guides of the prieſts in canto fermo.

This very curious, learned, and elegant publication ſeems to have eſcaped the notice of all our periodical works of criticiſm, nor have we ever ſeen it mentioned in any of our catalogues of old and curious books.

WALTHERIA, in *Botany*, received its name from Linnæus, in honour of Auguſtus Frederick Walther, profeſſor of Pathology at Leipſic, where he publiſhed, in 1735, an alphabetical catalogue of his own garden, with twenty-four plates, no very great acquiſition to ſcience. The author, being an able anatomiſt, gave ſome attention to the ſtructure of plants, on which he publiſhed an academical treatiſe in 1740; but, as it appears by Haller's account, without much that is new or inſtructive. He wrote alſo on the eſſential oils of vegetables, on the Egyptian *Lotus*, and on the *Silphium* of the antients, as elucidated, if ſuch a term be allowable, by their coins. This author died in 1746, at the age of 58. There have been ſeveral others of the ſame name, but ſcarcely entitled to claim a ſhare in the botanical diſtinction here conferred.—Linn. Gen. 348. Schreb. 453. Willd. Sp. Pl. v. 3. 586. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 138. Cavan. Diſſ. 315. Juſſ. 289. Lamarck Illuſtr. t. 570. Poiret in Lamarck Dict. v. 8. 323.—Claſs and order, *Monadelphia Pentandria*. Nat. Ord. *Columniferæ*, Linn. *Malvaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, double; the outer unilateral, of three leaves, deciduous: inner of one leaf, cloven half way down into five acute ſegments, cup-ſhaped, permanent. *Cor.* Petals five, inverſely heart-ſhaped, ſpreading, their claws inſerted into the lower part of the tube of the filaments. *Stam.* Filaments five, united into a tube, their upper part ſeparate, ſpreading, ſhort; anthers ovate. *Piſt.* Germen ſuperior, ovate; ſtyle thread-ſhaped, longer than the ſtamens; ſtigmas tufted. *Peric.* Capſule obovate, of one cell and two valves. *Seed* ſolitary, obtuſe, dilated upwards.

Eſſ. Ch. Calyx double; the outer lateral, of three leaves, deciduous. Petals five. Style one. Capſule of one cell, and two valves. Seed ſolitary.

A tropical genus, whoſe *flowers* are ſmaller than in moſt of the Mallow tribe, and always aſſembled numerouſly into little tufts or heads. The *ſtem* is ſhrubby. *Leaves* undivided, more or leſs ovate, ſerrated, generally downy. The ſimple *capſule*, with only one *ſeed*, makes the peculiar character of *Waltheria*, oppoſed to others of the ſame natural order.—Juſſieu refers this genus, along with *Hermannia* and *Mahernia*, to a ſection of his *Tiliaceæ*, which he terms *dubiæ*. We make no ſcruple to follow the example of Cavanilles, in removing it to the *Malvaceæ*, with which it accords in every eſſential point of character and habit.

1. W. *Americana*. American Waltheria. Linn. Sp. Pl. 941. excluding the ſyn. of Breynius. Willd. n. 1. Ait. n. 1. (W. Indica; Jacq. Ic. Rar. t. 130. Miſc. Auſtr. v. 2. 323. W. arboreſcens; Cavan. Diſſ. 316. t. 170. f. 1. Monoſperm-althæa arboreſcens villoſa, folio majore; Iſnard Mem. de l'Acad. des Sciences for 1721, German ed. 751. t. 32. Betonica arboreſcens, foliis amplioribus; Pluk. Almag. 67. Phyt. t. 150. f. 6.)—Leaves oval, plaited, downy, unequally and ſharply toothed. Heads of flowers ſtalked.—Native of the Bahama iſlands, and South America. Cultivated in the royal gardens at Hampton-court, in Plunkenet's time. A ſtove plant, flowering at various ſeaſons, after which it uſually dies, though ſhrubby, and perhaps naturally perennial. The *branches* are round, downy, leafy, wand-like, very ſoft when young. *Leaves* alternate, ſtalked, one to two inches, or more, in length, ſtrongly veined, plaited at the edges, extremely ſoft on both ſides, with denſe, hoary, minutely ſtarry, pubeſcence. *Stipulas* awl-ſhaped. *Flowers* ſmall, yellow, in denſe axillary,

 ſolitary

solitary tufts, each on a stout straight downy stalk, various in length, but usually about equal to the corresponding *footstalk*.

2. W. *Indica*. East Indian Waltheria. Linn. Sp. Pl. 941. Willd. n. 2. Ait. n. 2. (Malvinda ulmifolia, flosculis pusillis muscosis constipatis; Burn. Zeyl. 149. t. 68. Betonica arborescens maderaspatana, villosis foliis profundè venosis; Pluk. Almag. 67. Phyt. t. 150. f. 5.)—Leaves oval, plaited, downy, bluntly toothed. Heads of flowers sessile.—Native of the East Indies. Cavanilles unites it with the foregoing, but the blunter more shallow teeth of the *leaves*, which are perhaps less densely downy, and the constantly sessile heads of *flowers*, of a tawny yellow, appear sufficient marks of distinction, especially as the native countries of these two plants are so remote from each other. Mr. Aiton marks the *W. Indica* as a shrub, flowering in the stove from June to August, and cultivated by Miller before the year 1759. To the *Americana* he attaches the character of biennial.

3. W. *Lophanthus*. Crested South-sea Waltheria. Forst. Prod. 47. Willd. n. 3. (Lophanthus tomentosus; Forst. Gen. t. 14; see LOPHANTHUS.)—"Leaves roundish-heart-shaped, serrated, stalked, clothed with silky pubescence. Heads of flowers stalked. Bracteas imbricated."—Native of the Marquis islands. *G. Forster*.

4. W. *ovata*. Roundish-leaved Waltheria. Cavan. Diss. 317. t. 171. f. 1. Willd. n. 4.—Leaves roundish-ovate, acute, unequally toothed, densely downy. Heads of flowers sessile.—Gathered in Peru by Dombey, who, unaware of its real genus, named the plant *Aubentonia*. This is a bushy *shrub*, three or four feet high, downy and very soft in every part. *Leaves* of a very broad ovate figure, obscurely lobed or angular, one and a half or two inches long, sharply toothed. *Flowers* yellow, in small sessile *tufts*, some of the lower ones assembled upon short, leafy, axillary *branches*, not near so long as the leaves.

5. W. *angustifolia*. Narrow-leaved Waltheria. Linn. Sp. Pl. 941. Willd. n. 5. (W. microphylla; Cavan. Diss. 317. t. 170. f. 2.)—"Leaves oblong, obtuse, plaited, toothed, hoary. Heads of flowers nearly sessile."—Native of the East Indies. Willdenow says, "the *stem* is shrubby. Whole *plant* invested with thin pubescence. *Leaves* half an inch long, obtuse at each end. *Heads* supported by very short stalks." We are obliged to adopt from him our ideas of this species, having no certain means of knowing what Linnæus intended. The plant of *Fl. Zeylanica*, n. 244. is probably different from that of *Sp. Pl.* but the synonyms of this and *W. indica* are so confused, that they embroil rather than illustrate the subject, nor does the Linnæan herbarium throw any certain light upon it.

6. W. *elliptica*. Elliptic-leaved Waltheria. Cavan. Diss. 316. t. 171. f. 2. Willd. n. 6.—Leaves elliptic-oblong, obtuse, plaited, toothed, downy. Heads of flowers sessile.—Gathered by Sonnerat in the East Indies. The *leaves* are more downy, and thrice as long as in the last, though not broader; the *petals*, according to Cavanilles' plate, obtuse, not emarginate.

7. W. *glabra*. Smooth-leaved Waltheria. Poiret in Lam. n. 7.—Leaves smooth, ovato-lanceolate, bluntish, with tooth-like serratures. Heads of flowers alternate, on axillary stalks.—Native of Guadaloupe, described by Poiret from the herbarium of professor Desfontaines. A *shrub* related in many respects to the *W. americana*, but smooth in all its parts. The *branches* are slender, a little compressed, very smooth, dark brown. *Leaves* stalked, oval; somewhat lanceolate, two or three inches long, one and a half or two inches broad; smooth on both sides; paler beneath; rarely pointed. *Footstalks* slender, six or eight lines long. *Stipulas* lanceolate, pointed, deciduous. *Flowers* in dense, almost sessile, leafless tufts, ranged alternately on an axillary stalk. *Outer calyx* of three very narrow, smooth, deciduous leaves: *inner* permanent, bell-shaped, very smooth, with long, almost thread-shaped teeth. *Corolla* yellow, scarcely longer than the inner calyx. *Capsule* membranous, with one *seed*. *Poiret*. The genus is clear by this description.

8. W. *cordata*. Heart-leaved Waltheria. Leaves smooth, heart-shaped, sharply and unequally toothed. Heads of flowers ovate, solitary, on straight axillary stalks.—Native, we believe, of the West Indies. The *branches* are round, elongated, brown; very smooth below; their younger shoots roughish to the touch with minute points. *Leaves* from one to two inches long, on roughish *footstalks* about a quarter of their own length, broadly ovate, bluntish, veiny, but not plaited; more or less heart-shaped at the base; very unequally toothed; paler beneath. *Stipulas* awl-shaped. *Common flower-stalks* generally much longer than the footstalks, stout, each bearing a dense head of *flowers*, about half an inch long. *Calyx*, &c. answering nearly to the description of the last. The *seed* is solitary, turbinate, rather hard. The younger Linnæus received this plant by the name of *W. angustifolia*, which it cannot be. The smoothness of the *leaves* and most other parts distinguishes it from every described species, except the last, with whose description its *leaves* and *inflorescence* will by no means accord.

WALTHERIA, in *Gardening*, affords plants of the woody exotic kind, in which the species cultivated are the American waltheria (W. Americana); the Indian waltheria (W. Indica); and the narrow-leaved waltheria (W. angustifolia).

The first is a soft woody-stalked plant of small growth.

The second sort has a branching shrubby growth. And the last is of the woody-stalked kind.

They all afford flowers during the summer months.

Method of Culture.—These plants may be increased by seeds, which must be sown on a hot-bed; and when the plants are fit to plant out, they must be each removed into a separate small pot, and plunged into a fresh hot-bed, being afterwards treated in the same manner as other plants of the same nature, being kept in the bark-stove. In the second year they flower and produce seeds, but may be continued three or four years if they be often shifted, and the roots pared to keep them within compass. In the view of keeping the roots out of the tan, they should be drawn up out of it at least once in six weeks, during the summer season, and the plants be shifted out of the pots once in two months: with this management the second and third sorts may be continued several years, but the first seldom endures longer than two.

They have a good effect in stove collections among other potted plants.

WALTON, BRIAN, in *Biography*, editor of the English Polyglott Bible, was born about the year 1600 in the district of Cleveland, Yorkshire, and in 1615 admitted into Magdalen college, Cambridge, whence he removed to Peter-house. In 1623 he took the degree of M.A. being then curate and master of a school in Suffolk. Upon his removal to London, he became in 1626 rector of St. Martin's Orgar, and was distinguished for his talents and diligence among the London clergy. After having been instituted to other preferments in the church, he took the degree of D.D. in 1639; but in the civil war his livings were sequestered, and he was under a necessity of seeking shelter among the royalists at Oxford,

ford, where he formed the design of the Polyglott Bible, and which he actually commenced, upon his removal to London, in 1653. Indefatigable in his application, he completed this work in six vols. fol. in 1657; and it was the first work published in England by subscription. The protector's government also allowed him to import paper exempt from duty. For an account of this, as well as the other principal polyglotts, with a brief statement of their respective contents, we refer to the article POLYGLOTT. It is somewhat curious in the history of literature, that in the first preface to this work, Dr. Walton acknowledged his obligations to the protector for his patronage; but that after the Restoration, several alterations were made in this preface, and the paragraph in which he acknowledges his obligations to the protector is suppressed, and another transferring his respect to Charles is introduced in its room. (See Hollis's Memoirs, vol. i. p. 425. Bowyer's Origin of Printing, Appendix.) These alterations have occasioned a distinction among those who are curious in the editions of books between *republican* and *royal* or *loyal* copies of the Polyglott. The republican copy now before us is the rarest, and therefore bears the highest price. Dr. Owen in 1659 made an attack upon the prolegomena or appendix of this bible, which was annexed to two of his tracts published at Oxford, and in the same year Dr. Walton published an elaborate reply.

Soon after the Restoration, Dr. Walton presented his Polyglott to Charles II., who, in recompence of his services to religion and learning, appointed him his chaplain in ordinary, and bishop of Chester, to which see he was consecrated in December in 1660. In the following year, he was one of the commissioners at the Savoy conference. After his return to London from a visit to his diocese, in the autumn of that year, he was seized with a disease, which terminated his life on the 29th of November. His remains were interred in the cathedral of St. Paul's, and a sumptuous monument was erected to his memory. Biog. Brit.

WALTON, ISAAC, was born at Stafford in 1593; and settling in London as a shop-keeper, he married, about the year 1632, the sister of Dr. Ken, afterwards bishop of Bath and Wells. Satisfied with a moderate competency, he left business, and removed from London. Upon the decease of Dr. Donne, in 1631, whose ministry he attended during his residence in the city, he undertook, at the request of sir Henry Wotton, to collect materials for his life; but as Wotton, for whose use they were intended, died before he had an opportunity of executing his purpose, Walton, though destitute of a literary education, wrote this life, which he published in 1640, and also that of Wotton, which appeared in 1644. After his recess from business, his favourite amusement was fishing; and being expert in the practical part of this art, he wrote a book upon the subject, which he published in 1653 under the title of "Complete Angler, or Contemplative Man's Recreation," 12mo. This small tract, drawn up in the form of dialogue, was rendered interesting by the reflections that were introduced, and by the engravings of fishes that adorned it. Accordingly it became popular, and five editions of it, with successive improvements, appeared to the year 1676; and it is now a kind of standard book among those who pursue this recreation. Having lost his wife in 1662, he associated chiefly with the clergy, and whilst he was resident with Dr. Morley, bishop of Winchester, he was induced, by the suggestion of Dr. Sheldon, to write the life of Richard Hooker, which was followed by that of George Herbert; and both were published in 1670. In 1677 he published the life of Dr. Sanderson, which closed his literary labours. His life was prolonged to the age of ninety, when he was carried off at Winchester, in December 1683, by the severity of a hard frost. In his disposition and character, he was amiable, loyal, and religious; and in his style of writing simple and unaffected. A collection of his lives with notes was printed by Dr. Zouch in 1796, 4to. and again in 8vo., to which is prefixed a copious life of the author. Gen. Biog.

WALTON, in *Geography*, a post-township of Delaware county, in New York, about 85 miles from Albany; about 7 miles square, situated on both sides of Conquago, or the W. branch of the Delaware river; it is mountainous and hilly, with good soil along the streams; much of the hills is arable or meadow land, and good for grazing. The township is well watered, and affords timber, which is rafted to Philadelphia. Here are a Presbyterian meeting-house, and several schools. In 1810 the whole population was 1311, with 128 electors, 173 taxable inhabitants, and 183,357 dollars of taxable property.

WALTON, a town of Virginia; 60 miles S.W. of Richmond.

WALTON, a town of England, in Derbyshire; 3 miles S.W. of Chesterfield.—Also, a village of England, in the county of Gloucester, where there is a medicinal spring, similar to Cheltenham; 1 mile E. of Tewkesbury.

WALTON *le Dale*, a township of Lancashire; 7 miles W. of Blackburn.

WALTON-*on-the-Wolds*, a village and parish in the hundred of East-Goscote, and county of Leicester, England; 4 miles E. of Loughborough. See Nichols's History, &c. of Leicestershire.

WALTON-*upon-Thames*, a village in the hundred of Elmbridge and county of Surrey, England, is situated on the southern bank of the river, 14 miles N.E. by N. distant from Guildford, and 18 miles W.S.W. from London. Mr. Gough says it probably derived its name from an encampment on St. George's-hill, in the vicinity, called Wall-town. These works are said to have been of Roman construction as well as a larger encampment at Oatlands, and some topographers contend that Julius Cæsar raised a bridge over the Thames near this place. This however is very doubtful, although it seems satisfactorily proved, that many piles and pieces of timber have been raised from the bed of the river, and that these as well as the spot have long been called Cowey-stakes. In Walton are two annual fairs, one of which was established by grant of king Henry VIII. Apsecourt, in this parish, is an old mansion, belonging to Edmund Hill, esq.; but the land and extensive walled gardens are now let to a gardener. At Burwood-park is a handsome modern house, built by sir John Frederick, bart., who has lately much enlarged and improved the estate. Burhill is a seat in this parish, belonging to sir Charles Kemys Tynte, grandson of general Johnson, who obtained this estate in 1720 by the bequest of Peter de la Porte. Pains-hill is much celebrated for its fine grounds and beautiful gardens, which were first laid out by the honourable Charles Hamilton, and obtained very considerable popularity from having been formed from a sterile heath. Thus an apparent desert was transformed to a terrestrial paradise. Walpole, Gilpin, and other authors, have descanted on the beauties of this famed seat. One of these states, "there may be scenes where Nature has done more for herself, but in no place that I ever saw has so much been done for nature as at Pains-hill. The beauty and unexpected variety of the scene, the happy situation, elegant structure, and judicious form of the buildings; the flourishing state, uncommon diversity, and contrasted groupage of the trees, and the contrivance of the water, will not fail to awaken the most pleasing sensations." Mr. Hamilton sold this place to Benjamin Bond Hopkins, esq.,

efq., who erected a large manfion on the brow of the hill. Pains-hill is now the feat of the earl of Carhampton. At Walton is a very long bridge over the Thames. In the church is a large coftly monument by Roubiliac, to the memory of Richard, vifcount Shannon, who died in 1740, and who was at that time field-marfhal in the army, and commander-in-chief in Ireland. William Lilly, the aftrologer, was buried in the chancel of this church; and in other parts were interred the following perfons: Jerome Wefton, earl of Portland, who died in 1662; fir Jacob Edwards, bart., and his lady; Henry Skrine, efq., author of a tour in Wales, &c. Several of the Rodney family were buried in the church. In the chancel is a brafs-plate engraved with the figures of a man on the back of a ftag, and faid to commemorate the following perfon and fact:—John Selwyn, a keeper in Oatlands park, was particularly noted for his ftrength, agility, &c. One day when hunting a ftag in the faid park, in the prefence of queen Elizabeth, he fprang from his horfe's back on that of the deer, and there preferved his feat, till the animal had reached a fpot near her majefty, when Selwyn plunged his fword into the throat of the deer, and killed him on the fpot.—See Antiquarian Repertory, vol. i. 1807. For an account of Oatlands, &c. fee WEYBRIDGE. Hiftory and Antiquities of Surrey, by the Rev. Owen Manning and William Bray, efq., three vols. fol.

WALTUNGI, a fmall ifland on the E. fide of the gulf of Bothnia. N. lat. 65° 34. E. long. 25°.

WALTWIESE, a town of France, in the department of the Mofelle; 7 miles N.W. of Sar Louis.

WALTZ, in *Biography*, a German bafe finger, with a courfe figure, and a ftill coarfer voice, whom Handel, when abandoned by all the great fingers who had performed in the operas which he compofed for the Royal Academy, was obliged to employ in the place of Montagnana. It has been faid, that Waltz was originally Handel's cook. He frequently fung in chorufes and comic entertainments at Drury Lane, in our own memory; and, as an actor, had a great deal of broad humour. He played a little on the violoncello, and ufed to divert the band in the mufic-room under the ftage when not wanted in the orcheftra, with accompanying himfelf in ridiculous and fatirical fongs.

WALTZ, the name of a riotous German dance, of modern invention; of which the definition has not yet had admiffion in any mufical lexicon. The tune is gay, and always in triple time. All our great performers on keyed inftruments have compofed and publifhed tunes of this kind. The verb *waltzen*, whence this word is derived, implies to roll, wallow, welter, tumble down, or roll in the dirt or mire.

What analogy there may be between thefe acceptations and the dance, we pretend not to fay; but having feen it performed by a felect party of foreigners, we could not help reflecting how uneafy an Englifh mother would be to fee her daughter fo familiarly treated, and ftill more to witnefs the obliging manner in which the freedom is returned by the females.

WALUWE, in *Geography*, a town on the S.E. coaft of Ceylon; 40 miles S. of Yale.

WALWARNO, a river of England, which runs into the Lee, in the county of Chefter.

WAMAR, a fmall ifland in the Eaft Indian fea, near the W. coaft of Aroo. S. lat. 5° 30′. E. long. 134° 57′.

WAMBA, a town of Spain, anciently called Gertica; 6 miles N. of Valladolid.—Alfo, a province of the kingdom of Anziko, S.E. of Pombo.

WAMBERG, a town of Bohemia, in the circle of Konigingratz; 20 miles E.S.E. of Konigingratz.

WAMBRE, a river of Africa, in the kingdom of Anziko, which runs into the Bancaro, 25 miles N.E. of Concabella.

WAMBULA, a town of Sweden, in the province of Abo; 48 miles S.S.E. of Biorneborg.

WAMMELOF, a town of Sweden, in the province of Schonen; 25 miles S.E. of Lund.

WAMPACH, a town of France, in the department of the Forefts; 6 miles E.N.E. of Houfalife.

WAMPOOL, or WAMPUL, a river of England, in Cumberland, which runs into the Eden, at its mouth.

WAMPU, a town of China, fituated on the river between Macao and Canton, where veffels of different nations lie to take in their lading; not being allowed to go up higher. The air is faid to be unwholefome; 7 miles S. of Canton.

WAMPUM, a fort of fhells, feveral of which, being ftrung upon threads, are ufed as money among the Indians.

It is formed of the infide of the clam-fhell, a large fea-fhell bearing fome refemblance to that of a fcallop, which is found on the coafts of New England and Virginia. This fhell is made into fmall cylinders of about one quarter of an inch long, and a fifth of an inch over, and being bored as beads, is ftrung in great numbers upon long ftrings. In this ftate it paffes among the Indians in their ufual commerce, as filver and gold among us; but being loofe it is not fo current.

It is both white and black or purple; and the meaneft is in fingle ftrings, of which the white goes at five fhillings a fathom, and the black at ten; or by number, the white fix a penny, the black at three. The next in value to thefe fingle ftrings, is that which is wove into bracelets of about three-quarters of a yard long, black and white, in ftripes, and fix pieces in a row, the warp confifting of leather thongs, and the woof of thread; thefe the gentlewomen among them wear, wound twice or oftener about their wrifts.

The moft valuable of all is that woven into girdles or belts. Thefe are compofed of many rows, and the black and white pieces woven into fquares or other figures. Thefe girdles are fometimes worn as their richeft ornaments; but they are oftener ufed in their great payments, and make their nobleft prefents, and are laid up as their treafure. Grew's Mufæum, p. 370.

WAMWALO, in *Geography*, a town of Hindooftan, in Guzerat; 55 miles W. of Noanagur.

WANA, a town of Sweden, in the province of Tavaftland; 5 miles S.E. of Tavafthus.

WANASPATUCKET, a river of Rhode ifland, which runs into Providence river.

WANDA, a town of Algiers, in the province of Tremeçen; 35 miles S.W. of Tremeçen.

WANDASS. See WINDASS.

WANDECHY, in *Geography*, a town of Bootan; 4 miles N.W. of Taffafudon. N. lat. 27° 52′. E. long. 89° 31′.

WANDERSLEBEN, a town of Saxony, in the principality of Altenburg; 9 miles S.W. of Erfurt.

WANDESBECK, a town of the circle of Holftein; 3 miles N.E. of Hamburg.

WANDIPOUR, a town of Bootan, defended by a citadel, and confidered as a place of great ftrength; 15 miles E. of Taffafudon. N. lat. 27° 50′. E. long. 89° 47′.

WANDIWASH, a town of Hindooftan, in the Carnatic; taken by the Britifh troops in 1760; 38 miles N.N.W. of Pondicherry. N. lat. 12° 31′. E. long. 79° 46′.

WANDLACKEN, a town of Pruffia, in the province of Natangen; 4 miles E. of Gerdaven.

WANDLE, a river of England, in the county of Surrey, which runs into the Thames, below Wandſworth.

WANDO, a river of South Carolina, which runs into the Aſhley, N. lat. 33° 50′. W. long. 79° 58′.

WANDSU, in *Zoology*, the name of a ſpecies of monkey found in the iſland of Ceylon. It is all over of a fine deep black; but has a long white beard hanging from its chin.

WANDSWORTH, or WANDLESWORTH, in *Geography*, a village in the weſtern diviſion of Brixton hundred, in the county of Surrey, England, is ſituated on the banks of the ſmall river Wandle (which falls into the Thames in this pariſh), at the diſtance of ſix miles S.W. from St. Paul's cathedral, London. The pariſh, according to the population return of the year 1811, contained 905 houſes, and 5644 inhabitants, of whom 620 families were employed in various trades and manufactures. Aubrey, in his "Antiquities of Surrey," mentions a manufacture of braſs plates for frying-pans, kettles, and other culinary veſſels, which was eſtabliſhed here by Dutchmen who kept it a myſtery: the houſes where this buſineſs was carried on bore the name of frying-pan houſes. Towards the cloſe of the 17th century, when great numbers of French Proteſtants fled from the perſecution which prevailed in the reign of Louis XIV., many of them ſettled at Wandſworth, and eſtabliſhed a French church, which is now uſed as a meeting-houſe for Methodiſts. Among theſe refugees was a conſiderable number of hatters, who introduced their manufacture at this place with great ſucceſs. Though diminiſhed in its extent, the manufacture ſtill exiſts. The art of dyeing cloth has been practiſed here above a century, and is now carried on to a conſiderable extent: as is alſo calico-printing, of which here are two extenſive manufactories. Here are alſo eſtabliſhments for printing kerſeymeres, for bolting cloth, and for whitening and preſſing ſtuffs: likewiſe iron-mills, oil and white-lead mills, vinegar works, and diſtilleries. Wandſworth church, which ſtands nearly in the centre of the village, is a brick ſtructure, and conſiſts of a nave, chancel, and two aiſles: at the weſt end is a ſquare tower, built in the year 1630. In 1780 the greater part of the church was rebuilt, at the expence of about 3500*l.* The Quakers have a meeting-houſe and two ſchools in this pariſh. Among the benefactions to the poor of Wandſworth is 500*l.* bequeathed by Henry Smith, alderman of London, who was born here about 1540, died in 1627, when he was buried in the church. He alſo left large eſtates, real and perſonal, to be allotted to the poor of various pariſhes, according to the diſcretion of his executors. In this diſtribution the county of Surrey has been principally regarded.

Garrett, a hamlet within this pariſh, appears to have been about two centuries ago a ſingle houſe, called the Garvett. It now contains about fifty houſes, and is well-known as the ſcene of a mock election on the meeting of every new parliament: when ſeveral noted characters in low life appear as candidates, being furniſhed with clothes and equipages by the publicans, who derive conſiderable profits from the crowds of people who aſſemble on ſuch occaſions.—Lyſons's Environs of London, vol. i. 1796.

WANFRIED, a town of Germany, in the principality of Heſſe Rhinfels, on the Werra; 13 miles W. of Mulhauſen. N. lat. 51° 12′. E. long. 10° 14′.

WANG, a town of Bavaria, in the biſhopric of Freyſing; 20 miles S. of Weilhaim.—Alſo, a town of Auſtria; 12 miles S. of Ips.

WANG-*Tooth*, a term ſometimes applied to the jaw-tooth of an animal.

WANGA, in *Geography*, a town of Sweden, in Eaſt Gothland; 11 miles N.N.E. of Linkioping.—Alſo, a town of Weſt Gothland; 46 miles E. of Uddevalla.

WANGARA, or GUANGARA, a country of Africa, watered by the Niger, which paſſes through it from W. to E. and is ſuppoſed ſoon after to loſe itſelf in a lake or the ſandy deſert. This country is ſubject to Bornou, to the S. of which it lies. It was formerly, *i. e.* about the 11th century, ſubject to the ſovereign of Ghera, which was called by the Arabians, according to the Arabian writers on the eaſtern part of the great central river, the Nile of the Negroes. Wangara, denominated the land of gold, is repreſented as formed into a ſpecies of iſland by branches of the Nile, which ſurround it on all ſides, and which overflowing during the rainy ſeaſons, laid waſte the whole country under water. When the inundation ſubſided, the inhabitants are deſcribed as ruſhing with eagerneſs, and digging up the earth, in every part of which they found gold. Soon afterwards the merchants arrived from every part of Africa, to exchange their commodities for this gold. The principal cities of Wangara were Raghabid and Samagonda, ſituated on the ſhore of large freſh-water lakes. In the time of Leo Africanus, Ghera, mentioned under the name of Caro, no longer held the ſupremacy among the ſtates of the Niger, but had become ſubject to the kingdom of Tombuctoo, founded A.D. 1215. Wangara, or Guangara, had become an independent kingdom, whoſe ſovereign maintained a conſiderable army; and the gold, for which this region is ſo celebrated, is repreſented by Leo as found, not within itſelf, but in mountains to the ſouth. It appears that at a later period the caravans traded to Wangara for gold.

WANGEN, a town of Switzerland, and capital of a bailiwick, in the canton of Berne; 20 miles S. of Berne.—Alſo, a town of France, in the department of the Lower Rhine; 12 miles W. of Straſburg.—Alſo, a town of Germany, on the Argen, lately imperial, till, in 1802, it was given among the indemnities to the elector of Bavaria. Its territory only included a few villages. The inhabitants are Roman Catholics; 22 miles W. of Kempten. N. lat. 47° 43′. E. long. 10° 50′.

WANGENDORFF, a town of the duchy of Stiria; 8 miles S.W. of Gnaa.

WANGERIN, a town of Pomerania; 20 miles N.E. of Stargard. N. lat. 53° 38′. E. long. 15° 32′.

WANGEROEG, an iſland in the German Ocean; about 12 miles in circumference; 4 miles from the coaſt of Frieſland. N. lat. 53° 44′. E. long. 7° 45′.

WANGEROW, a town of Pomerania; 12 miles S.E. of New Stettin.

WANGWELL, a ſmall iſland in the Pacific Ocean, near the S. coaſt of Waygoo. S. lat. 0° 23′. E. long. 131° 35′.

WANHOM, in the *Materia Medica*, a name by which Kæmpfer has called the plant, of which the great galangal of the ſhops is the root.

WANJEW, in *Geography*, a town of Poland, in the palatinate of Bielſk, near the conflux of the Narew and the Wanjewka; 24 miles N.N.W. of Bielſk.

WANJEWKA, a river of Poland, which runs into the Narew, near Wanjew, in the palatinate of Bielſk.

WANKANER, a town of Hindooſtan, in Guzerat; 45 miles N. of Junagur.

WANKAREY, a town of Hindooſtan, in the country of Viſiapour; 6 miles W. of Poonah.

WANLASS, in *Hunting*. See WINDASS.

WANNAS, in *Geography*, a town of Sweden, in Weſt Bothnia; 22 miles N.W. of Umea.

WAN-NASH-REESE, a lofty rugged mountain of Algiers,

Algiers, generally covered with snow, supposed to have been anciently called Zalacus; 45 miles S. of Shershell.

WANNOUGAH, a mountain of Algiers; 100 miles W. of Constantina.

WANO, a town of Sweden, in the province of Tavastland; 4 miles S.E. of Tavasthus.

WANOOAETTEE, a small island in the Pacific Ocean; 10 miles W.N.W. of Wateehoo.

WANORA, a small island on the W. side of the gulf of Bothnia. N. lat. 64° 32′. E. long. 21° 14′.

WANQUI, a country of Africa, on the Gold coast.

WANSAWAR, a town of Hindoostan, in Guzerat; 25 miles N. of Junagur.

WANSBECK. See Wensbeck.

WANSEN, a town of Silesia, in the principality of Brieg; 10 miles S.S.W. of Ohlau.

WANSINGAR, a small island on the W. side of the gulf of Bothnia. N. lat. 63° 5′. E. long. 18° 32′.

WANSLEBEN, John-Michael, in *Biography*, the son of a Lutheran minister at Erfurt, in Thuringia, was born in 1635; and having studied philosophy and theology at Konigsberg, he acquired a knowledge of the Ethiopic language under the instruction of Ludolf, by whom he was sent to London to publish his Ethiopic dictionary in 1661; and he was also employed by Castell in compiling his "Lexicon Heptaglotton." Upon his return to Germany, Ernest, duke of Saxe-Gotha, engaged him to visit Abyssinia, for the purpose of acquainting himself with the language and natural history of that country; but having reached Cairo in 1663, he was prevented from proceeding to Abyssinia, as it is thought, by his own misconduct, and embarking at Alexandria in 1665, he arrived in Italy; and in the following year abandoned Lutheranism, and entered into the Dominican order. Upon his being introduced to Colbert at Paris, in 1670, he was engaged to make a visit to Abyssinia, and to bring home all the manuscripts which he could purchase. During his residence of twenty months in Egypt, he transmitted for the Royal Library at Paris 334 manuscripts, Arabian, Persian, and Turkish. But not being able to enter Abyssinia, he went to Constantinople, and from thence in 1676 he was recalled to France, on account of his irregular conduct. Being at length reduced to want, he gained a mere subsistence by serving the village church of Bouron as vicar, where he died at the age of fifty-eight, in the year 1693. His principal publications are, "The Liturgy of Dioscorus, Patriarch of Alexandria," Lond. 1662; "An Account of the present State of Egypt, in Italian," 1671; "Nouvelle Relation en forme de Journal d'un Voyage fait en Egypte au 1672 et 1673;" "Histoire de l'Eglise d'Alexandria," 1677; which is said to contain a more accurate catalogue of the patriarchs of Alexandria than that of Ludolf communicated to the Jesuits of Antwerp. Moreri.

WANSTA, in *Geography*, a town of Sweden, in the province of Schonen; 25 miles E. of Lund.

WANSTEAD, a village and parish in the hundred of Becontree and county of Essex, England, is situated eight miles N.E. from St. Paul's cathedral, London. The old parish-church was repaired and enlarged in the early part of the last century, principally at the expence of the first earl Tylney; but being still found small and incommodious, it was pulled down, and a new church erected on a larger scale, nearly adjoining to the old scite. The first stone of the present structure was laid July 13th, 1787: it was finished in 1790, and consecrated June 24th in that year. It is built with brick, and cased with Portland stone; the portico is of the Doric order: at the west end is a cupola, supported by eight Ionic columns. The interior consists of a nave, chancel, and two aisles, separated by columns of the Corinthian order. In the chancel is a beautiful window of stained glass, by Eginton of Birmingham, representing our Saviour bearing the cross, from the picture at Magdalen college, Oxford: here is also a superb monument, with the effigy of the deceased in white marble, to the memory of sir Josiah Child, bart., who died in 1699. The population of the parish, as enumerated under the act of the year 1811, was 210; the number of houses 1127.

Wanstead-house was designed by Colin Campbell, in the year 1715, and executed under his direction for sir Richard Child, who was afterwards advanced to the peerage by the title of earl Tylney. This edifice occupies the scite of an ancient mansion, which, with the annexed demesne, had previously been possessed successively by sir William Mildmay, George, marquis of Buckingham, king James I., Charles Blount, earl of Devonshire, Robert Rich, earl of Leicester, and his father Robert, lord Rich. The latter built the old house, which was called Naked-hall-house, and in which queen Elizabeth and her court were sumptuously entertained in May 1578 for several days. Sir Richard Child, finding this house inadequate to his domestic establishment, employed Mr. Campbell to build the present splendid mansion. It consists of a centre with two uniform flanks or wings, and extends about 260 feet in front by nearly 80 feet in depth. The middle portion has a noble pediment, supported by six columns of the Corinthian order, which rest on a bold projecting basement. This forms the entrance, by a double flight of steps, to the great hall and saloon, the former of which measures 51 feet by 36, and 36 feet in height; and the latter forms a cube of 30 feet. These communicate with a double suite of state apartments, which extend along the whole of both fronts, and are connected at the south end by a grand ball-room, which is 64 feet by 24. In strict accordance with the principal front, and imitative of the style of Italian villas, the architect has raised a stone parapet, with a series of detached obelisks, to form two sides of the entrance court, the third being bounded by a ha-ha. The whole of this area has lately been laid out as a rich parterre or flower-garden; and executed from the designs of Mr. Repton. Of a style and character with the exterior architecture is the interior finishings and furniture of the house. Thus formed and thus embellished, Wanstead-house may be said to vie with many foreign palaces, and to rank with those English mansions which proclaim the riches and splendour of the country. At the commencement of the present century, this house was the residence of the royal family of France; and here also was the first splendid entertainment given to congratulate the marquis, now duke of Wellington, on his return from his victorious campaigns in Spain and Portugal. Wanstead-house, with its contiguous property, and extensive estates in Essex, Hants, Wilts, Yorkshire, and Dorsetshire, came into the possession of William Wellesley Pole, esq., by marriage, in March 1812, with Catherine Tylney Long, daughter and heiress of sir James Tylney Long, bart.—Beauties of England and Wales, vol. v. Essex. By J. Britton and E. W. Brayley, 1803. Lysons' Environs of London, vol. iv. 4to. 1796.

WANT, in *Zoology*, a name sometimes given to the mole.

WANTAGE, anciently Wanating, in *Geography*, a market-town of considerable antiquity in the hundred of the same name, in the county of Berks, England, is situated on the skirts of the prolific vale of White-horse, at the distance of 10 miles S.W. from Abingdon, 26 miles N.W. by W. from Reading, and 59 miles in the same bearing from London.

London. A variety of concurring teſtimonies render it probable that this place was once a Roman ſtation; though the numerous alterations which it has undergone almoſt preclude the poſſibility of tracing thoſe remains which would decide the queſtion. The vallum, ſaid to be part of a Roman ſtation, was plainly to be ſeen when Mr. Wiſe viſited it about the year 1738, "incloſing a ſpace called the High garden." A hollow way into the town from Farringdon, Grove-ſtreet, a moraſs, and a brook, form the ſides of an oblong ſquare, containing about ſix acres of ground. On this ſpot, continues Mr. Wiſe, "ſtood the Saxon palace where Alfred was born." North of the brook is an incloſure where Roman coins have been found; and the remains of a building called king Alfred's cellar, which was paved with brick, and appears to have been a bath. Wantage was probably of conſequence in the Saxon times, as it was undoubtedly a royal villa, and appears, together with the ſurrounding country, to have been the patrimony of the Weſt Saxon kings: by the will of Alfred, it was bequeathed to his couſin Alfrith. It is a market-town by preſcription, having obtained that privilege about the beginning of the 13th century, through the intereſt of Fulk Fitzwarine, on whom it was beſtowed by Roger Bigod, earl marſhal of England, as a reward for military ſervices. The market-day is Saturday; and here are four annual fairs. The civil government is veſted in a chief conſtable. In the population return of the year 1811, the town is ſtated to contain 510 houſes, occupied by 2386 perſons. The chief employment of the inhabitants is the manufacture of coarſe cloth and ſacking. The pariſh church is a ſpacious cruciform ſtructure, built either wholly, or in part, by the Fitzwarine family, whoſe arms and effigies are to be ſeen in various parts of the edifice; which alſo contains ſome old pompous monuments, and a large ancient font conſtructed of porphyry-ſtone. An act of parliament paſſed in the year 1598, for veſting the town lands of Wantage given in the reigns of Henry VI. and Henry VII. for charitable uſes, in twelve of the "better ſort of inhabitants" to be deemed a body corporate. By this act the revenues of the ſaid lands are appropriated to the relief of the poor, the repairs of the highways, and the ſupport of a grammar-ſchool. An Engliſh ſchool has, from an early period, been added to the other charitable objects provided for out of the profits of theſe lands. The governors allow 30*l.* *per annum* to the maſter of the grammar-ſchool, who muſt be a graduate in one of the univerſities; and 15*l.* *per annum* to the maſter of the Engliſh ſchool. In 1680 an alms-houſe for twelve poor perſons was founded and endowed by Mr. Robert Styles. Dr. Joſeph Butler, a learned divine, and biſhop of Durham in the laſt century, was born in this town: but its chief celebrity is its having been the birth-place of king Alfred, peculiarly ſtiled the Great. See Alfred.—Lyſons' Magna Britannia, vol. i. Berkſhire, 1806. Beauties of England and Wales, vol. i. Berkſhire. By J. Britton and E. W. Brayley, 1801.

Wantage, a town of New Jerſey, in the county of Suſſex, containing 2969 inhabitants; 15 miles N. of Newtown.

WANTI. See Glove.

WANTING, in *Geography*, a town on the E. coaſt of Lower Siam. N. lat. 7° 39′. E. long. 100° 55′.

WANTSUM, a name given to the river Stour, which divides the iſle of Thanet from the reſt of the county of Kent, and runs into the Downs, below Sandwich.

WANTY, in *Rural Economy*, the name uſually given to a broad girth of leather, by which the load is bound upon the back of the horſe. It is very uſeful in hilly diſtricts for ſecuring various kinds of loads.

WANTZENAU, in *Geography*, a town of France, in the department of the Lower Rhine; 6 miles N. of Straſburg.

WANTZLAU, a town of the Middle Mark of Brandenburg; 9 miles S.S W. of Brandenburg.

WANZCY, in *Botany*, a tree very common throughout all Abyſſinia. Every houſe in Gondar has two or three planted round it, ſo that, when firſt viewed from the heights, it appears like a wood, eſpecially through the whole ſeaſon of the rains, but very exactly on the 1ſt of September, for three years together, in a night's time, it was covered with a multitude of white flowers. Gondar, and all the towns about it, then appeared as if covered with white linen, or with new-fallen ſnow. It grows to a conſiderable magnitude, being from eighteen to twenty feet high; the trunk is generally about three feet and a half from the ground; it then divides into four or five thick branches, which have at leaſt 60° inclination to the horizon, and not more. Theſe large branches are generally bare, and half way up the bark is rough and furrowed. They then put out a number of ſmall branches, circular at top, in figure like ſome of our early pear-trees. (See the deſcription of it in the Appendix to Bruce's Travels.) This tree and the coffee-tree have divine honours paid by each of the ſeven nations; under this tree their king is choſen; here he holds his firſt council; his ſceptre is a bludgeon made of this tree, which, like a mace, is carried before him wherever he goes; it is produced in the general meetings of the nation, and is called "Buco."

WANZLEBEN, in *Geography*, a town of Weſtphalia, in the duchy of Magdeburg; 10 miles W.S.W. of Magdeburg.

WAPENTAKE, or Weapentake, a diviſion of certain northern countries, particularly thoſe beyond the Trent, anſwering to what in other places is called a *hundred*, or a *cantred*.

Authors differ as to the origin of the word. Brompton brings it from the Saxon *waepen*, and *taecan*, *to deliver*, by reaſon the tenants anciently delivered their arms to every new lord as a token of their homage.

Sir Thomas Smith gives a different account. Muſters, he obſerves, were anciently taken of the armour and weapons of the ſeveral inhabitants of every hundred; and from ſuch as could not find ſufficient pledges for their good abearing, their *weapons* were taken *away*, and delivered to others.

Others give a different account of its riſe; *viz.* that when firſt the kingdom was divided into wapentakes, he who was the chief of the diviſion, and whom we now call *high-conſtable*, as ſoon as he entered upon his office, appeared in the field, on a certain day, on horſeback, with a pike in his hand; and all the chief men of the hundred met him with their lances, who, alighting, touched his pike with their lances, as a ſignal they were firmly united to each other, by the touching of their weapons. Whence the denomination *wapentakes*, from the Saxon *waepen*, and *tac*, *touching*.

WAPESSAGA, in *Geography*, a lake of Canada. N. lat. 48° 10′. W. long. 71° 40′.

WAPITWAGO Islands, a cluſter of iſlands near the ſouth coaſt of Labrador. N. lat. 50° 4′. W. long. 60° 20′.

WAPLES, a town of Pruſſia, in the province of Oberland; 16 miles S.E. of Oſterrode.

WAPNO, a town of Bohemia, in the circle of Koniggratz; 14 miles S.W. of Konigingratz.

WAPP, in a *Ship*, that rope with which the ſhrowds are ſet taught with wale-knots; one end is made faſt to the ſhrowds, and to the other are brought the laniards.

WAPPE, a ſpecies of cur. The name is derived from its

its note; its only use was to alarm the family by barking, if any person approached the house. See Dog.

WAPPER, in *Ichthyology*, a name given by some to the smaller species of the river gudgeon.

WAPPING'S Creek, in *Geography*, a river of New York, which runs into the Hudson, 7 miles S. of Poughkeepsie.

WAPPO, a town of Africa, on the Grain coast. N. lat. 4° 55′. W. long. 8° 20′.

WAPPOCOMO, a river of Virginia, which runs into the Potomack, 9 miles E.S.E. of Fort Cumberland.

WAPSTENO, a town of Swedish Lapland; 115 miles N.W. of Umea.

WAPUWAGAN Islands, a cluster of islands near the coast of Labrador. N. lat. 50° 2′. W. long. 60° 14′.

WAR, Bellum, a contest or difference between princes, states, or large bodies of people; which, not being determinable by the ordinary measures of justice and equity, is referred to the decision of the sword: or, it is that state in which a nation prosecutes its right by force.

Hobbes's great principle is, that the natural state of man is a state of warfare; but most other politicians hold war to be a preternatural and extraordinary state.

War may be considered, says archdeacon Paley, with a view to its *causes* and to its *conduct*. The *justifying* causes of war are deliberate invasions of right, and the necessity of maintaining such a balance of power amongst neighbouring nations, as that no single state, or confederacy of states, be strong enough to overwhelm the rest. The objects of just war are precaution, defence, or reparation. In a larger sense, every just war is a *defensive* war, inasmuch as every just war supposes an injury perpetrated, attempted, or feared.

A *defensive* war is opposed to that which is *offensive*; and as in the former case, the sovereign power of a nation takes up arms to repel the attacks of an enemy, so, in the latter, arms are taken up in order to attack a nation that lived in peace with the others. War is so dreadful an evil, and so destructive in its progress and effects, that it should never be undertaken without the strongest reasons. Humanity is shocked at a sovereign who, without imperious necessity, lavishes the lives of his most faithful subjects, and who exposes his people to the havoc and miseries of war, when they might enjoy an honourable and salutary peace; and if this want of love for his people be accompanied with injustice towards those whom he attacks, what guilt does he incur, or rather what a dreadful series of crimes does he commit? The slaughter of men, the pillage of cities, the devastation of provinces, are his crimes. He is responsible to God, and accountable to man, for every person that is killed. The violences, the crimes, the various disorders attendant on the licentious tumult of arms, pollute his conscience, and blacken his account, as he is the original author of them all.—May this faint sketch, says the excellent Vattel, affect the hearts of the leaders of nations, and in military enterprises suggest to them a circumspection proportional to the importance of the subject! Vattel states the following triple end as the distinguishing characteristic of a lawful war: 1. To recover what belongs or is due to us. 2. To provide for our future safety by punishing the aggressor or offender. 3. To defend ourselves from an injury by repelling an unjust violence. The two first are the objects of an offensive, the third that of a defensive war. Camillus, when he was going to attack the Gauls, concisely represented to his soldiers all the causes which can justify a war: "Omnia quæ defendi, repetique et ulcisci fas est." Liv. l. ix. c. 49.

The *insufficient* causes, or unjustifiable motives of war, according to Paley, are the family alliances, the personal friendships, or the personal quarrels of princes; the internal disputes which are carried on in other nations; the justice of other wars; the extension of territory, or of trade; the misfortunes or accidental weakness of a neighbouring or rival nation. There are *two* lessons of rational and sober policy, says this excellent writer, which, if it were possible to inculcate into the councils of princes, would exclude many of the motives of war, and allay that restless ambition which is constantly stirring up one part of mankind against another. The first of these lessons admonishes princes to "place their glory and their emulation, not in extent of territory, but in raising the greatest quantity of happiness out of a given territory." The enlargement of territory by conquest is not only not a just object of war, but, in most instances in which it is attempted, not even desirable. What commonly is gained to a nation, by the annexing of new dependencies, or the subjugation of other countries to its dominion, but a wider frontier to defend, more interfering claims to vindicate, more quarrels, more enemies, more rebellions to encounter, a greater force to keep up by land and sea, more services to provide for, and more establishments to pay? And in order to draw from these acquisitions something that may make up for the charge of keeping them, a revenue is to be extorted, or a monopoly to be inforced and watched, at an expence which costs half their produce. Thus the provinces are oppressed, in order to pay for being ill governed; and the original state is exhausted in maintaining a feeble authority over discontented subjects. Do opulence and extent of dominion always constitute the happiness of states? Among the multitude of instances that present themselves to notice, let us confine ourselves, says Vattel, to the Romans. The Roman republic ruined itself by its triumphs, the excess of its conquests and power. Rome, the mistress of the world, when enslaved by tyrants, and oppressed by a military government, had reason to deplore the success of its arms, and to look back with regret on those happy times when its power did not reach beyond Italy, or even when its dominion was almost confined within the circuit of its walls. Dr. Paley mentions two cases in which the extension of territory may be of real advantage, and to both parties. The first is, where an empire thereby reaches to the natural boundaries which divide it from the rest of the world. Thus we account the British Channel the natural boundary which separates the nations of England and France: and if France possessed any counties on this, or England any cities or provinces on that side of the sea, the recovery of such towns and districts, to what may be called their natural sovereign, though it might not be a just reason for commencing war, would be a proper use to make of victory. The other case is, where neighbouring states, being severally too small and weak to defend themselves against the dangers that surround them, can only be safe by a strict and constant junction of their strength: here conquest will effect the purposes of confederation and alliance; and the union which it produces is often more close and permanent, than that which results from voluntary association.

The second rule of prudence, to which we have above referred, and which ought to be recommended to those who conduct the affairs of nations, is, "never to pursue national *honour* as distinct from national *interest*." "The dignity of his crown, the honour of his flag, the glory of his arms," in the mouth of a prince, are stately and imposing terms; but the ideas they inspire are insatiable. The pursuit of honour, when set loose from the admonitions of prudence, becomes

becomes in kings a wild and romantic paſſion; eager to engage, and gathering fury in its progreſs, it is checked by no difficulties, repelled by no dangers: it forgets or deſpiſes thoſe conſiderations of ſafety, eaſe, wealth, and plenty, which, in the eye of true public wiſdom, compoſe the objects, to which the renown of arms, the fame of victory, are only inſtrumental and ſubordinate. The purſuit of intereſt, on the other hand, is a ſober principle; computes coſts and conſequences; is cautious of entering into war; ſtops in time: when regulated by thoſe univerſal maxims of relative juſtice which belong to the affairs of communities, as well as of private perſons, it is the right principle for nations to proceed by; even when it treſpaſſes upon theſe regulations, it is much leſs dangerous, becauſe much more temperate than the other.

Another object of conſideration, in reference to this ſubject, is the *conduct* of war. If the cauſe and end of war be juſtifiable, all the means that appear neceſſary to the end are juſtifiable alſo. War is a conteſt by force, between parties who acknowledge no common ſuperior; and as it does not include in its idea the ſuppoſition of any convention which ſhould reſtrict the operations of force, it has naturally no boundary, but that in which force terminates, the deſtruction of the life againſt which the force is directed. Nevertheleſs, the licence of war authoriſes no acts of hoſtility but what are neceſſary or conducive to the end and object of the war. Gratuitous barbarities borrow no excuſe from this plea. The ſlaughter of captives, the ſubjecting of them to indignities or torture, the violation of women, the profanation of temples, the demolition of public buildings, libraries, ſtatues, and, in general, the deſtruction or defacing of works that conduce nothing to annoyance or defence:—theſe enormities are prohibited not only by the practice of civilized nations, but by the law of nature itſelf; as having no proper tendency to accelerate the termination, or accompliſh the object of the war; and as containing that, which in peace and war is equally unjuſtifiable, ultimate and gratuitous miſchief.

The laws of war, which are part of the law of nations, impoſe other reſtrictions upon the conduct of war. To this head we may refer the duty of refraining in war from poiſon, and from aſſaſſination. Such practices are at preſent excluded by the uſage and opinions of civilized nations; and the firſt recourſe to them would be followed by inſtant retaliation. The licence of war then acknowledges *two* limitations: it authorizes no hoſtilities which have not an apparent tendency to effectuate the object of the war; it reſpects thoſe poſitive laws which the cuſtom of nations hath ſanctified, and which, whilſt they are mutually conformed to, mitigate the calamities of war, without weakening its operations, or diminiſhing the power or ſafety of belligerent ſtates.

Before a juſt war is undertaken, we owe, ſays Vattel, this further regard to humanity, and eſpecially to the lives and tranquillity of the ſubjects, to declare to the unjuſt nation with which we are about to contend, that we are at length recurring to the laſt remedy, and going to make uſe of open force, for bringing it to reaſon. This is called "declaring war." All this is included in the Roman manner of proceeding, regulated in their Fecial law. They firſt ſent the chief of the Feciales or heralds, called "Pater Patratus," to demand ſatisfaction of the people which had offended them; and if within the ſpace of thirty-three days this people did not return a ſatisfactory anſwer, the herald called the gods to be witneſſes of the wrong, and came away ſaying, that the Romans would conſider what they had to do. The king, and afterwards the conſul, uſed to aſk the ſenate's opinion; and the war being reſolved on, the herald was ſent back to the frontier, where he declared it. It is ſurpriſing to find among the Romans ſuch juſtice, ſuch moderation, and wiſdom, at a time too when apparently nothing but courage and ferocity were to be expected from them. By this religious conduct, previous to its war, Rome laid the moſt ſolid foundation for its future greatneſs.

A declaration of war being neceſſary as a farther trial for terminating the difference without the effuſion of blood, by making uſe of the principle fear, for bringing the enemy to more equitable ſentiments; it is, at the ſame time that it declares the reſolution taken of making war, to ſet forth the cauſe of that reſolution. This is at preſent the conſtant practice among the powers of Europe.

If in conſequence of ſuch declaration, the enemy offers equitable conditions of peace, the right of war ceaſes. Formerly the powers of Europe uſed to ſend heralds or ambaſſadors to declare war; at preſent this is only done in the capital, the principal towns, or on the frontiers. Maniſeſtoes are iſſued, and the communication, ſo eaſy and expeditious from the eſtabliſhment of poſts, ſoon ſpreads the intelligence. Beſides, it is in ſome caſes neceſſary for a nation to publiſh the declaration of war for the inſtruction and direction of its own ſubjects, in order to fix the date of the rights belonging to them from the moment of this declaration, and relatively to certain effects which the voluntary law of nations attributes to a war in form. Without ſuch a public declaration of war, it would be difficult to ſettle, in a treaty of peace, thoſe acts which are to be accounted the effects of the war, and thoſe which each nation may conſider as wrongs, for obtaining reparation. He who is attacked, and makes only a defenſive war, need not declare it; the ſtate of war being ſufficiently determined by the declaration of the enemy, or his open hoſtilities. Nevertheleſs, from dignity, or for the direction of his ſubjects, a ſovereign, though attacked, ſeldom fails of declaring war in his turn. By the law of nations, the declaration of war need not be made till the enemy has reached the frontiers; but it muſt always precede the commiſſion of any hoſtility. Thus we provide for our own ſafety, and equally procure the end of the declaration of war, which is, that an unjuſt adverſary may ſtill ſeriouſly conſider his meaſures, and avoid the horrors of war, by doing juſtice. The ſovereign, having entered a country, and declared war, may proceed, if equitable conditions are not offered him, to hoſtile operations. The ſovereign declaring war can neither detain thoſe ſubjects of the enemy, who are within his dominions at the time of the declaration, nor their effects. He is to allow them a reaſonable time for withdrawing with their effects; and if they ſtay beyond the term preſcribed, he has a right to treat them as enemies, though as enemies diſarmed.

Becauſe the Chriſtian ſcriptures deſcribe wars, as what they are, ſays Paley, as crimes or judgments, ſome have been led to believe that it is unlawful for a Chriſtian to bear arms. But it ſhould be remembered, that it may be neceſſary for individuals to unite their force, and, for this end, to reſign themſelves to the direction of a common will; and yet it may be true, that that will is often actuated by criminal motives, and often determined to deſtructive purpoſes. Hence, although the origin of wars be aſcribed in ſcripture to the operation of lawleſs and malignant paſſions; and though war itſelf be enumerated amongſt the ſoreſt calamities with which a land can be viſited, the profeſſion of a ſoldier is no where forbidden or condemned. See Luke, iii. 14. Luke, vii. 9. Acts, x. 1. On the ſubject of this article,

article, fee Paley's Phil. vol. ii. Vattel's Law of Nations, book iii.

The fole prerogative of making war and peace belongs, by the Englifh conftitution, to the king. But as a king of England can neither raife money nor compel his fubjects to take up arms, without the concurrence of parliament, his right of making war is only a flender prerogative, unlefs the parliament feconds him with fupplies. Levying war againft the king in his realm is a fpecies of treafon.

War, *Civil*, or *Inteftine*, is that between fubjects of the fame realm; or between parties in the fame ftate.

In this fenfe we fay, the civil wars of the Romans deftroyed the republic; the civil wars of Granada ruined the power of the Moors in Spain; the civil wars in England began in 1641, and ended in the king's death, 1648.

When a party is formed in a ftate, which no longer obeys the fovereign, and is of ftrength fufficient to make head againft him; or when, in a republic, the nation is divided into two oppofite factions, and both fides take arms; this is called a civil war. Some confine this term only to a juft infurrection of fubjects againft an unjuft fovereign, to diftinguifh this lawful refiftance from rebellion, which is an open and unjuft refiftance: but what appellation will they give to a war in a republic torn by two factions, or in a monarchy between two competitors for the crown? Ufe appropriates the term of civil war to every war between the members of one and the fame political fociety. If it be between part of the citizens on one fide, and the fovereign with thofe who continue in obedience to him on the other; it is fufficient that the malcontents have fome reafon for taking arms, to give this difturbance the name of civil war, and not that of rebellion. This laft term is applied only to fuch an infurrection againft lawful authority, as is void of all appearance of juftice. The fovereign indeed never fails to term rebels all fubjects openly refifting him; but when thefe become of ftrength fufficient to oppofe him, fo that he finds himfelf compelled to make war regularly on them, he muft be contented with the term of civil war.

If we confider the reafons why a civil war is warranted or juftified, we recur to a queftion of very delicate inveftigation, and of very difficult folution. It involves the inquiry, in what cafes a fubject may not only refufe to obey, but even refift a fovereign, and by force repel force. (See Sovereignty.) But omitting the juftice of the caufe, we fhall here advert to the maxims that ought to be obferved in a civil war, and confider whether it be incumbent on the fovereign to keep within the laws of common war. A civil war breaks the bands of fociety and government, or at leaft it fufpends their force and effect; it produces in the nation two independent parties, confidering each other as enemies, and acknowledging no common judge: therefore of neceffity thefe two parties muft, at leaft for a time, be confidered as forming two feparate bodies, two diftinct people, though one of them may be in the wrong in breaking the continuity of the ftate, to rife up againft lawful authority, they are not the lefs divided in fact. Befides, who fhall judge them? who fhall pronounce on which fide the right or the wrong lies? On earth they have no common fuperior. Thus they are in the cafe of two nations, who having a difpute which they cannot adjuft, are compelled to decide it by force of arms.

In this ftate of the cafe, the common laws of war, or maxims of humanity, moderation, and probity, fhould be obferved on both fides in civil wars. The fame reafons on which the obligation between ftate and ftate is founded, render them even more neceffary in the unhappy circumftance when two incenfed parties are deftroying their common country. Should the fovereign conceive he has a right to hang up his prifoners as rebels, the oppofite party will make reprifals: if he does not religioufly obferve the capitulations, and all the conventions made with his enemies, they will no longer rely on his word: fhould he burn and deftroy, they will follow his example; the war will become cruel and horrid; its calamities will increafe on the nation. Whenever a numerous party thinks it has a right to refift the fovereign, and finds itfelf able to declare that opinion fword in hand, the war is to be carried on between them in the fame manner as between two different nations; and they are to leave open the fame means for preventing enormous violences, and reftoring peace.

A fovereign having conquered the oppofite party, and reduced it to fubmit and fue for peace, he may except from the amnefty the authors of the troubles, and the heads of the party; may bring them to a legal trial, and on conviction punifh them. He may efpecially act thus with regard to difturbances, raifed not fo much on account of the people's interefts as the private views of fome great men, and which rather deferve the appellation of rebellion than of civil war.

When fubjects take up arms, without ceafing to acknowledge the fovereign, and only to procure a redrefs of grievances, there are two reafons for obferving the common laws of war towards them. 1. Left a civil war becoming more cruel and deftructive by the reprifals, which, as we have obferved, the infurgents will oppofe to the prince's feverities. 2. The danger of committing great injuftice, by the haftily punifhing thofe who are accounted rebels; the tumult of difcord, and the flame of a civil war, little agree with the proceedings of pure and facred juftice: more quiet times are to be waited for. It will be wife in the prince to fecure his prifoners till, having reftored tranquillity, he is in a condition of having them tried according to the laws.

As to the conduct of foreign nations, they ought not to interfere in the conftitutional government of an independent ftate. It is not for them to judge between contending citizens, nor between the prince and his fubjects: to them the two parties are equally foreigners, equally independent of their authority. They may, however, interpofe their good offices for the reftoration of peace; and this the law of nature prefcribes to them. But if their mediation proves fruitlefs, they who are not tied by any treaty may, for their own conduct, take the merit of the caufe into confideration, and affift the party which they fhall judge to have right on its fide, in cafe this party fhall requeft their affiftance, or accept the offer of it: they may, for the fame reafon that they are at liberty to efpoufe the juft quarrel of a nation entering into a war with another. As to the allies of a ftate diftracted by a civil war, they will find a rule for their conduct in the nature of their engagements, combined with the circumftances of the war. Vattel's Law of Nations, book iii.

War, *Gladiators*. See Gladiators.

War, *Holy*, is that anciently maintained by leagues and croifades, for the recovery of the Holy Land.

War, *King's*, *Bellum Regis*. At the time when particular lords were allowed to make war with one another, to revenge injuries, inftead of profecuting them in the ordinary courts of juftice, the appellation *king's war* was given to fuch war as the king declared againft any other prince, or ftate: on which occafion, the lords were not allowed to make private war againft each other; as being obliged to ferve the king, with all their vaffals.

War, *Religious*, is a war maintained in a ftate, on ac-

count of religion; one of the parties refusing to tolerate the other.

WAR, *Social.* See SOCIAL *War*.

WAR, *Art of.* See MILITARY *Art*.

WAR, *Council of.* See COUNCIL.

WAR, *Habiliments of.* See HABILIMENTS.

WAR-*Horse.* See HORSE.

WAR, *Man of.* See SHIP, RATE, &c.

WAR, *Officers of.* See OFFICERS.

WAR, *Place of,* is a place fortified on purpose to cover and defend a country, and stop the incursion of an enemy's army: or it is a place in which are disposed the provisions of war, for an army encamped in the neighbourhood; or whither an army retires into winter-quarters. See PLACE.

WAR-*Cry,* was formerly customary in the armies of most nations, when just going to engage. Sometimes they were only tumultuous shouts, or horrid yells, uttered with an intent to strike terror into their adversaries; such as is now used by the Indians in America, called the *war-whoop.*

WARA, in *Geography,* a city of Africa, capital of the country of Bergoo; 35 miles S.S.E. of Bornou. N. lat. 15° 30'. E. long. 25° 30'.

WARADIN. See WARDEIN.

WARADURA, a town of Hindoostan, in the circar of Cuddapa; 18 miles W.S.W. of Cuddapa.

WARANG, or FORMOSA, a small island near the coast of Guinea. N. lat. 11° 26'. W. long. 16° 28'.

WARANGER, a town of Finmark; 22 miles S.W. of Wardhys.

WARANGOLE, a town of Hindoostan, in Golconda; 45 miles N.N.E. of Hydrabad. N. lat. 17° 55'. E. long. 79° 15'.

WARASDIN. See VARASDIN.

WARASDINS, a kind of Sclavonian soldiers, clothed like the Turks, with a sugar-loaf bonnet instead of a hat. Their arms are a fuzee and pistols; the butt-end of their fuzee serves for a spade, when they have occasion to throw up earth.

WARBEETLES, in animals, the name by which the large maggots or worms, which are bred in the backs of neat cattle and other animals, are sometimes provincially called.

WARBERG, or WARBURG, in *Geography,* a town of Westphalia, in the bishopric of Paderborn. It contains two churches, two convents, and two castles. It was formerly imperial, and one of the Hanse towns. In the year 1760, the French were defeated by the British and allies, under the hereditary prince of Brunswick; 16 miles S.S.E. of Paderborn. N. lat. 51° 37'. E. long. 9° 11'.

WARBERG, a sea-port town of Sweden, in the province of Halland. It has a harbour on the North sea, which, at present, has only depth enough for small vessels. Warberg carries on a considerable trade, and had stood on three different situations before the year 1666, when it was built the fourth time on the spot where it now stands. A very ancient fortified castle stands at the harbour's mouth, on a rock, surrounded with water, but at present is of little service; 32 miles N.N.W. of Halmstadt. N. lat. 57° 7'. E. long. 12° 4'.

WARBLERS, in *Ornithology,* a name by which Mr. Pennant distinguishes an order of birds, comprehending the nightingale, red-start, red-breast, black-cap, petty-chaps, hedge-sparrow, yellow, gold-crested, and common wren, the sedge-bird, or lesser reed-sparrow, the tit-lark, or grasshopper-lark, the wheat-ear, whinchat, stone-chatter, and white-throat: their general characters are, that the bill is slender and weak, the nostril small and sunk, and the exterior toe joined at the under part of the last joint to the middle toe. Some of these birds have tails of one colour, and others have party-coloured tails. Brit. Zool. vol. i. p. 363. See MOTACILLA.

WARBLES, in animals, a term sometimes applied to the small hard tumours or swellings on the sides or saddle part of the horse's back, that are occasioned by heat in travelling, or the uneasiness of its situation; and also to the large worms or maggots in the backs of these animals, neat cattle, and some others. It is said that a hot greasy cloth, at first frequently applied, will sometimes remove the first of these sorts of tumours; and camphorated spirit of wine is always very effectual for dispersing them, more especially if a little spirit of sal ammoniac be mixed with it. If the horse should be wanted for work, care should be taken to have the saddle nicely chambered and fitted. In these kinds of tumours, especially where they are caused by sandy or gravelly matters insinuating themselves between the skin of the animal and the saddle, or its girths, much may often be done in dispersing them, by applying to the parts salt dissolved in water, brandy, or warm vinegar, and in some cases a mixture composed of four parts of opodeldoc to one of spirits of turpentine.

In all cases where horses are returned to the stables, after long journeys, the saddles should not be removed for fifteen or twenty minutes, the girths being only loosened; as, by this simple means, many of these swellings may be prevented, which would otherwise take place.

In cases where the skin is rubbed off the parts, the tincture used for wounds, or friar's balsam, may be applied three or four times a day, and the places defended by diachylon plasters, with great benefit.

But in the case of real warbles, which are produced from a fly, known by the name of ox or gad-fly, by the puncturing of small holes in the backs and sides of these different sorts of cattle stock, and there depositing its ova or eggs, which are speedily hatched by the heat of the animal's body, small tumours arising in consequence, which contain grubs, and which have small openings in their middle parts, that answer as spiracula, and for casting out the superfluous matter, which, if confined, might soon produce considerable abscesses, and destroy the grubs; other modes of cure or removal are to be had recourse to. With some it is the practice to attempt to dislodge them, by pressing strongly the different sides of the lumps or tumours with the thumb and fingers. But a more ready and certain way of eradicating and destroying such grubs is that of pulling off the scabs, that commonly cover the holes or openings on the tops of the swellings, and pouring a few drops of the oil of linseed, in mixture with the spirits of turpentine and vitriolic acid, into the openings on the parts, or by the use of the turpentine alone.

WARBLING *of the Wings,* in *Falconry,* is when a hawk, after having mantled herself, crosses her wings over her back.

WARBURTON, WILLIAM, in *Biography,* an English prelate, was the son of an attorney at Newark-upon-Trent, where he was born December 24, 1628, and destined by his father for his own profession. With this view, after he had finished his ordinary grammar education, he was articled, in 1714, to an attorney at East Markham, in Nottinghamshire; and when he had completed his clerkship of five years, he was admitted in one of the courts at Westminster; and returning to Newark, commenced the exercise of his profession. But it was soon found, that his talents and disposition were more adapted to the church than to the law; and, therefore, in 1723, he took deacon's orders. To his first

first work, consisting of "Miscellaneous Translations in Prose and Verse," from Roman authors, was prefixed a Latin dedication to sir George Sutton, who, in 1726, presented him to a small vicarage. Towards the close of this year he visited London, and became acquainted with some of the inferior literati of that period, and particularly with Theobald, to whom he communicated some notes on Shakspeare. He joined with these in their confederacy against the reputation of Pope, of whom Warburton said, that, whilst "Milton borrowed by affectation, and Dryden by idleness, Pope borrowed by necessity." In 1727 he evinced his ability for original writing, by "A Critical and Philosophical Inquiry into the Causes of Prodigies and Miracles, as related by Historians, with an Essay towards restoring a Method and Purity in History, in which the Characters of the most celebrated Writers of every age, and of the several Stages and Species of History, are occasionally criticised and explained." This work was dedicated, in very respectful and complimentary language, to sir Robert Sutton, his first patron; by whose interest he was placed in the list of king's masters of arts, upon his majesty's visit to Cambridge in 1728; and by this academical degree he supplied the defects of his education. He was also presented by the same patron to the rectory of Broad Broughton, in Lincolnshire, where he remained some years in the assiduous prosecution of his studies. In 1736 he engaged the public attention as a writer by his well-known work, entitled "The Alliance between Church and State; or, the Necessity and Equity of an established Religion and a Test-law, demonstrated from the Essence and End of Civil Society upon the fundamental Principles of the Law of Nature and Nations." The design of this work, as it is stated by a defender of it against an attack of lord Bolingbroke, was "to vindicate our present happy constitution *on a principle of right*, by adjusting the precise bounds of the two societies, by shewing how they came to act in conjunction, and by explaining the nature of their union; and from thence, by natural and necessary consequence, inducing, on the one hand, an *established religion*, with all its rights and privileges, secured by a *test-law;* and on the other, a full and free *toleration* to all who dissented from the national worship." This was a popular performance, and four editions of it appeared in the author's life-time; but it gave satisfaction neither to the high church party, nor to the advocates for religious liberty. Our author's greatest work was published in 1738, and entitled "The Divine Legation of Moses, demonstrated on the Principles of a religious Deist, from the Omission of the Doctrine of a future State of Rewards and Punishments." This adventurous and paradoxical performance found adversaries amongst persons of all parties, who concurred in criticising and censuring the theory on which it is founded. Undismayed by his opponents, he not only published a "Vindication" of his opinion, but persevered in the prosecution of his work, abounding with learning and paradoxes, and calculated to amuse rather than to convince its readers. In a second corrected and enlarged edition of the first volume of his "Divine Legation," he professes to have omitted "passages, which were thought vain, insolent, and ill-natured." In the year 1738 he published a sermon, entitled "Faith working by Charity to Christian Edification," and became chaplain to the prince of Wales. Wishing probably to regain the good opinion of Mr. Pope, he published, in the "Works of the Learned," a defence of his "Essay on Man," against the remarks of M. de Crousaz. Whatever was his design, Mr. Pope acknowledged his obligations; and an intimacy commenced between them, which very much contributed to the subsequent advancement of the apologist. The second volume of the "Divine Legation" was published in 1741, and the work became the general repository of the author's literary effusions, and of various controversies in which he was engaged. In the course of this year he was introduced by Pope to Mr. Allen, at his house near Bath, where he was afterwards a frequent visitor. In return for the poet's attention, he vindicated his writings by notes and comments, and thus so far confirmed and enhanced the friendship that subsisted between them, that when Pope died, in 1744, he bequeathed to Warburton half his library, and the property of all his works already printed, and not otherwise disposed of, the value of which legacy is estimated by Johnson at 4000*l*.

The controversial antagonists of Warburton and of his "Divine Legation" were numerous, and comprehended such names as those of Drs. Middleton, Pococke, Grey, Sykes, and Stebbing; against whom he defended himself, in 1744 and 1745, in a publication, entitled "Remarks on several occasional Reflections, &c." with a degree of asperity, and conscious superiority and self-confidence, which discriminated his style of writing. The introduction to Mr. Allen's friendship terminated in a marriage with his favourite niece, Miss Gertrude Tucker, which took place in 1745, and which ultimately put him in possession of the splendid seat of Prior-Park. His Three Sermons, in defence of the Protestant establishment and civil constitution, preached on occasion of the rebellion, were held in high estimation. In the year 1746 he became preacher to the Society of Lincoln's Inn; and in the following year he appeared as an editor of Shakspeare. Bold and original in his criticisms and conjectures, the absurdity of several of which has been exposed by Edwards, Johnson, and others, he has nevertheless thrown light on some obscure passages, and drawn forth into view latent beauties, so that many of his notes will find a place in the approved editions of this admirable dramatist. Warburton's "Julian, or a Discourse concerning the Earthquake and fiery Eruption which defeated that Emperor's Attempt to rebuild the Temple at Jerusalem," published in 1750, on occasion of Dr. Middleton's "Inquiry concerning the miraculous Powers," is commended for its candour, a quality for which the writer was not remarkably distinguished, and of which few specimens occurred in the controversy produced by Dr. Middleton's publication. The notes annexed to his complete edition of Pope's works, in 9 vols. 8vo., are said by the most competent judges to have disguised and perverted the author, and to have aggravated the satirical asperities of the poet by the malignities of the annotator. Two volumes of Warburton's sermons, preached at Lincoln's Inn, were published in 1753 and 1754; and in these, as well as in a series of letters addressed to a friend in the following year, he exhibits "A View of Lord Bolingbroke's Philosophy." He was now rapidly advancing from one stage of preferment to another; from that of prebend of Gloucester, obtained in 1753, to that of king's chaplain in ordinary in 1754; and in 1755 to that of prebend of Durham, in exchange for that of Gloucester, to the honour of a Lambeth degree of D.D. conferred upon him by archbishop Herring, to the deanery of Bristol in 1757, and in 1759 to the see of Gloucester. Being appointed on the following 30th of January to preach before the house of lords, he closed his sermon with the following summary of the character of the martyr: "In a word, his princely qualities were neither great enough nor bad enough to succeed in that most difficult of all attempts, the enslaving a free and jealous people." Of the Methodists Dr. Warburton had spoken with some degree of asperity, in the second volume of his "Divine Legation," in 1742; and

and in 1762 he more directly and severely attacks their leading principles, in his work entitled "The Doctrine of Grace, or the Office and Operation of the Holy Spirit vindicated from the Insults of Infidelity and the Abuses of Fanaticism." In 1763 he was the mover in the house of lords of a charge against Mr. Wilkes, as the author of an indecent "Essay on Women;" for which he was abusively attacked by Churchill, and others of that party. In 1765, a fourth edition of the second part of his "Divine Legation" appeared, as the third, fourth, and fifth volumes of that work. In this edition he treated the father of the learned Dr. Lowth in a manner so illiberal, as to occasion an acrimonious controversy between these antagonists. A third volume of his "Sermons" was published in 1767; and in 1768 he transferred 500*l.* to trustees, for defraying the charge of a lecture at Lincoln's Inn, instituted with a view of proving the truth of Christianity from a completion of the prophecies in the Old and New Testament relating to the Christian church. The decay of his faculties was soon afterwards accelerated by the death of his only child, who was carried off by a consumption in his 19th year; and his life terminated at Gloucester, June 7th, 1779, in the 81st year of his age. His works were collected and printed by Dr. Hurd, bishop of Worcester, in 1788, comprehended in 7 vols. 4to., to which the editor has prefixed an account of his life, writings, and character. In 1809 appeared "Letters from a late eminent Prelate to one of his Friends," (Warburton to Hurd,) containing reflections on the literature of the times; but "lamentably deformed," as a biographer before us justly observes, "by the arrogance and imperative spirit of one prelate, and the adulation of the other." Dr. Johnson, in his "Life of Pope," has justly delineated the literary character of bishop Warburton, of whom it is said that he was kind in the domestic relations of life, and ardent in his friendship, in the following passage: "He was a man of vigorous faculties, a mind fervid and vehement, supplied by incessant and unlimited inquiry, with wonderful extent and variety of knowledge, which yet had not oppressed his imagination, nor clouded his perspicuity. To every work he brought a memory full fraught, together with a fancy fertile of original combinations; and at once exerted the powers of the scholar, the reasoner, and the wit. But his knowledge was too multifarious to be always exact, and his pursuits were too eager to be always cautious. His abilities gave him a haughty consequence, which he disdained to correct or mollify; and his impatience of opposition disposed him to treat his adversaries with such contemptuous superiority, as made his readers commonly his enemies, and excited against the advocate the wishes of some who favoured the cause. He seems to have adopted the Roman emperor's determination, "Oderint dum metuant." He used no allurements of gentle language, but wished to compel rather than persuade. His style is copious without selection, and forcible without neatness: he took the words that presented themselves; his diction is coarse and impure, and his sentences are unmeasured." Hurd. Nichols. Johnson. Gen. Biog.

WARD, Seth, D.D., in *Biography*, an eminent mathematician, was born at Buntingford, in Herts, in 1617, and completed his education at Sidney college, Cambridge, of which he became a fellow. Mathematics were his favourite study; but his pursuits were interrupted by the civil war, as he chose to share the fate of his friend and patron, Dr. Samuel Ward, the master of his college, to accompany him in his imprisonment, and to attend him even on his death-bed, in 1643. In consequence of refusing to take the covenant, he was deprived of his fellowship in 1644, and of all means of support at the university. Many opportunities of private instruction in families of distinction presented themselves; but preferring residence with Ralph Freeman of Aspenden-hall, esq., whose sons he taught, he continued with him till the year 1649, when he was appointed chaplain to Thomas lord Wenman of Tame-park, in Oxfordshire. On the expulsion of Mr. Greaves, civilian professor of astronomy at Oxford, he was chosen to succeed him, but with the condition of taking the oath called the engagement. Having raised the astronomical lecture to reputation, he, together with his friend Dr. Wallis, was made doctor of divinity; and they both concurred in attending those meetings at Wadham college, which laid the foundation of the Royal Society, of which he became a fellow in 1661, and for several years second president. In 1659 he was chosen president of Trinity college, but resigned it in favour of the legal owner. After the Restoration, he became vicar of St. Lawrence-Jewry, in London, in 1660; soon after dean of Exeter, and, by the interest of Monk and Clarendon, bishop of that see, which he improved in a variety of respects by his munificence. At Salisbury, to which he was translated in 1667, he conciliated universal respect by his charity and hospitality. To this see he was a distinguished benefactor, obtaining for its bishop the perpetual honour of being chancellor of the order of the Garter, which had been for more than a century alienated from it; and founding in the town the college of matrons in 1682, for the maintenance of ten widows of orthodox ministers in the diocese. Although he was not naturally of a persecuting disposition, yet he was active in executing the orders which he received from court for the suppression of conventicles. In consequence of a fever, with which he was attacked in 1660, his bodily strength declined, and his intellectual faculties were impaired; and at length he closed a melancholy life in 1689, in the 72d year of his age. Mr. Oughtred gives him the character of a prudent, pious, and ingenious person, skilled not only in mathematics, but in all branches of polite literature. According to Burnet, he was, in many respects, one of the greatest men of his age: but he elsewhere says, that his sincerity was much questioned; being a profound statesman, but an indifferent clergyman. His various works on mathematics and astronomy were valued at the time when they were written, but they have been superseded by modern discoveries and improvements. For an account of the hypothesis that bears his name, see the article Anomaly. He published, besides sermons, "A philosophical Essay towards the Eviction of the Being and Attributes of God, the Immortality of the Souls of Men, and the Truth and Authority of Scripture," Oxford, 1652, 8vo.; "De Cometis, ubi de Cometarum Natura disseritur, nova Cometarum theoria ex novissima Cometæ Historia proponitur. Prælectio Oxonii habita, et Inquisitio in Ismaelis Bullialdi Astronomiæ Philolaicæ Fundamenta," Oxon. 1653, 4to.; "Idea Trigonometriæ demonstrata, in Usum Juventutis," Oxon. 1654, 4to.; "In Thomæ Hobbii Philosophiam Exercitatio Epistolica, ad D. J. Wilkinsium Guardianum Coll. Wadkami," ibid. 1656, 4to.; "Astronomia Geometrica: ubi Methodus proponitur qua primariarum Planetarum Astronomia sive Elliptica sive Circularis possit geometricé absolvi," Lond. 1656, 8vo. Biog. Brit. Hutton's Dict.

Ward, John, LL.D., the son of a nonconformist minister, was born in London in 1679, and for some years, after a competent education, occupied a place in the Navy-office; but devoted to literary pursuits, he quitted this situation in 1710, and became a school-master. As a member of a society, established for literary improvement, he read, in

in alternation with others, lectures on civil law, and the law of nature and nations. His first production as a writer was a small Latin essay, containing rules for composition, published in 1712. In 1720 he was chosen professor of rhetoric in Gresham college; and in 1723 a fellow of the Royal Society, having in that year translated into Latin Dr. Mead's treatise on the plague. To Vossius's "Elementa Rhetorica," printed in 1724, he added a valuable appendix, "De Ratione Interpungendi." He engaged in the controversy between Dr. Mead and Dr. Middleton concerning the condition of physicians in ancient Rome; and he annexed to Horsley's "Britannia Romana" an "Essay on Peutinger's Table so far as it relates to Britain." In 1736 he became a member of the Society of Antiquaries, of which he was afterwards vice-president. His "Lives of the Gresham Professors" was published in 1740; and in 1751 he was honoured by the university of Edinburgh with the title of LL.D. When the British Museum was established in 1753, he was chosen one of the trustees, to which he rendered considerable service by his advice and co-operation in forming the rules of that important and useful institution. Notwithstanding the variety of his literary occupations, and his studious habits, he prolonged his life to his 80th year, and died in 1758. After his death, a valuable work, which he had prepared for the press, was published, entitled "A System of Oratory, delivered in a Course of Lectures publicly read at Gresham College," in 2 vols. 8vo. The Transactions of the Royal and Antiquarian Societies contain several of his papers, chiefly on subjects of antiquity. In his religious profession he was a Protestant dissenter, distinguished by rational piety, and great moderation and candour towards persons of all persuasions. To persons engaged in literary pursuits he was ready at all times to communicate advice and assistance; and his modesty was equal to his learning. Nichols' Lit. Anecd. Gen. Biog.

Unfortunately, before we perused Dr. Ward's Lives, &c., says a coadjutor, we had read Fontenelle's Eloges of the members of the Royal Academy of Sciences at Paris; panegyrics, which not only afford amusement, but instruction to readers; as that elegant and ingenious writer so describes the science, learning, and peculiar character and abilities of each individual whom he celebrates, that the reader of taste, if neither scientific nor learned before he has seen these Eulogies, becomes both in the course of perusal.

But Mr. Prof. Ward's work, says Dr. Burney, neither amuses us by the grace, dignity, or eloquence of style, nor instructs by its science. His materials are scanty, nor has he sufficiently applied to useful purposes those which he had amassed. The genealogy of the professors is all that he has laboured, and that not very successfully. Our chief inquiry of him was confined to the music-professors; but we obtained no information concerning any one of them, except Dr. Bull; and all he knew of that great musician he had from Dr. Pepusch, the studious, learned, and worthy organist of the Charter-House. Out of thirteen professors of music, who had had the honour of being placed in the chair, after Bull, previous to the year 1740, when Ward's biographical work was published, there appears no reason for the election of any one of them for their musical science or talents, except Dr. Bull. None of the rest had ever distinguished themselves either in the theory or practice of music, or been authors of any work on the art or science, which could qualify them for becoming candidates for the professorship.

The long and dry list of Dr. Bull's fugitive pieces is given in a language now utterly obsolete, and unintelligible to the generality of readers.

WARD, ——, an English madrigalist of the second class, during the reign of James I. Ward was one of the first who transformed his madrigals into *fancies* for lutes and viols. No instrument, except the organ, had been much cultivated in England at this time; so that sonatas, solos, or concertos, were wholly unknown to us; and like our betters, the ancient Greeks, our instruments had nothing but vocal music to perform: in choruses, doubling the voice parts in unisons and octaves, and playing nomes, and other vocal airs, for their solos.

WARD, *Warda*, *Custody*, or *Keeping*. See GUARD.

WARD is a word used in our *Law Books*, in divers significations. Thus, a ward, in London, is a part of the city, committed to the special charge of one of the aldermen of the city. There are twenty-six wards in London, which are as hundreds, and the parishes thereof as towns.

A forest is also divided into wards; so also are most of our hospitals. See HOSPITAL.

A prison is sometimes also called a ward.

The heir of the king's tenant, who held by knights-service, or in capite, was also called a ward, during his non age. But this sort of wardship is taken away by the statute 12 Car. II. cap. 24. See GUARDIAN, in *Chivalry*.

WARD, *Watch and*. See WATCH.

WARD, *Castle*. See CASTLE.

WARD-*Room*, the apartment in a ship in which the officers mess, &c. next under the captain's cabin.

WARD, *Warda*, *Wardagium*, is also used, in our *Ancient Writers*, for the custody of a town or castle, which the tenants and inhabitants were bound to keep at their own charge. See WARDSHIP.

WARD'*s Medicines*, a denomination given to certain medical nostrums, originally prepared and dispersed by Mr. Ward, and which were some years ago much celebrated for their efficacy in a variety of disorders.

The methods of compounding the principal of these medicines was communicated to the public about fifty years ago by I. Page, esq., to whom Mr. Ward left his book of receipts; and in order to their being procured at a cheap rate, his late majesty settled a pension on Messrs. White and Osterman, the two chemists who had been employed by Mr. Ward in preparing them, on condition that the profits arising from the sale of them should be applied to the support of the Asylum and Magdalen charities.

These medicines are the red pill and emetic sack drop, the white drop, sweating powders, liquid sweat, paste for piles and fistulas, dropsy purging powders, and essence for the head-ache.

The method of preparing the antimony for the pill and drop is as follows:—The finest and purest crude antimony is powdered, and ten or twelve ounces of it put into an earthen unglazed pan that holds three or four quarts, and set on a fire; the mass is stirred with an iron spatula, and the fire raised till it sends forth fumes, and a flame like burning brimstone; and the same degree of fire is continued, and the mass stirred, till no fumes escape from it, and it becomes a grey or ash-coloured powder. If it should melt and run into lumps, it must be taken out of the pan, and pounded again, and then put in and stirred as before, till it be thoroughly calcined. Then four ounces of the crude matter must be added; and the process repeated, till a sufficient quantity has been thus prepared. The process must be performed in a chimney, lest the fumes should injure the operator. Into a clean crucible, holding about a quart, put about two pounds of the calcined antimony; set it in a melting furnace, and make a gradual fire under it; put coals round

round the crucible nearly to the top; keep the mafs in a ftate of moderate fufion, occafionally ftirring it with an iron rod. When the matter that adheres to the rod appears bright and tranfparent, which, with a proper degree of fire, will be in about half an hour after it is in fufion, pour the vitrified matter on a fmooth marble, well dried, and heated as hot as the hand can bear; repeat the procefs, in order to obtain more of the matter, if neceffary; and thus will be had a fair and pure glafs of antimony, of a light red colour.

In order to prepare the *pill*, take a quantity of this glafs of antimony; pound it in a clean iron mortar, and fift it through a fine lawn fieve; then grind, or levigate it, on a fmooth marble, to an impalpable powder: take alfo dragon's blood dried and powdered; and put one ounce of this to four ounces of the levigated glafs; grind them well together; and with good fack, or rich mountain wine, make them into a mafs for pills, of about one grain and a half each, which is a full dofe for a man or woman.

The *drop* is made by putting about half an ounce of the levigated glafs of antimony into a quart of the richeft Malaga mountain or fack; fhake them well together, and let them ftand two or three days to fettle, and grow clear; then pour it off gently, to be quite fine. The full dofe for a man or woman is half an ounce; but it is advifable to begin with the half or two-thirds, according to the age, or ftrength of conftitution. Thefe medicines, it is faid, cannot be fafely adminiftered, if the vifcera are unfound. They have been ufually given in diforders occafioned by foul ftomachs and indigeftion; and the pill has been very fuccefsful in inveterate rheumatifms: both the pill and the drop frequently operate upward and downward, but with lefs ftraining than the emetics ufually given. The pill muft be bruifed, and taken in a fpoonful of any fmall liquid, on an empty ftomach: if it works upwards or downwards, it will be proper to drink a fmall quantity of balm or fage-tea, between each motion; and if it fweats, as it fometimes does, let the patient keep himfelf warm, and encourage it by drinking the above fmall liquors; when it is taken, milk, greens, and fruit, muft be avoided. The potion, called the *drop*, requires no vehicle: when the ficknefs comes on, let the patient drink about half a pint of warm water, or thin water gruel, and continue to do fo every time it works.

The *white drop* is prepared by bruifing fourteen pounds of the cleaneft copperas into a rough powder; then drying it with a gentle heat, and fpreading it thin, till it becomes a dry and fubtile powder, refembling quick-lime, but much whiter. When this operation is finifhed, which requires about fix or feven days, take an equal quantity of good and clean rough nitre, or falt-petre, tolerably dry; pound the nitre and copperas together; fift the powder through a fine hair-fieve, put it into a large glafs retort, coated at bottom, and fet it in a fand-furnace about an inch from the bottom and fides of the fand-pan; fix on with lute a large receiver, leaving a fmall vent-hole in the joint to prevent the burfting of the retort or receiver; make a gentle fire for the firft three hours; and gradually increafe it for three or four hours longer, till the iron pan be red-hot at bottom; continue the fire about thirty hours; and then let it out, and when it is cool, you obtain a very powerful aqua-fortis; put this into a bottle, ftop it clofe, and let it ftand fix or eight days to digeft itfelf. Put this aqua-fortis into a glafs retort about half or two-thirds full; fet it in the fand-heat, and fix on a receiver; make a moderate fire, till the aqua-fortis is come over into the receiver, leaving behind only a brown, reddifh earth: by this procefs is obtained a very ftrong and pure aqua-fortis. Put a quantity of this rectified aqua-fortis into a large bolt-head, with a long neck, fo as to make it about a quarter full; then take of the pureft and fineft volatile fal ammoniac, in which there is not the leaft acid falt, or lime. To fixteen ounces of the aqua-fortis in the bolt-head, add, by half an ounce at a time, feven ounces of the volatile fal ammoniac, ftopping the mouth of the bolt-head, (a vent-hole excepted,) till the fermentation ends; let it ftand two or three hours, till the fumes are fettled. Next put it into a fmaller bolt-head, half full, and fet it in a moderate fand-heat; when it is warm, put four ounces of the fineft quickfilver to each pound of fixteen ounces of the folution, and let it ftand in the heat till the quickfilver is diffolved; increafe the fire, and add quickfilver; and when it will diffolve no more, take it out of the bolt-head, and put it into an open glafs veffel, or a white, large ftone bowl; fet it in a moderate fand-heat, and let it evaporate till a pellicle or fkin comes over the top of it; then put it in a cool place to congeal. The heavy liquor, or oil, which remains congealed, muft be poured off, and thoroughly drained, and the remaining falt muft be put into a glafs body; to each pound adding three pounds of the fineft rofe-water, and ftopping the mouth of the glafs with a piece of double brown paper. Set it again in the fand-heat with a moderate fire, till the falt is wholly diffolved, which is ufually effected in twenty-four hours; and thus is the white drop prepared.

This medicine, it is faid, cannot be accounted dangerous; as there is not in two drops, ufually taken in twenty-four hours, half a grain of mercury. It has been adminiftered with fuccefs as an antifcorbutic in all ftages of the fcurvy, and even when the difeafe has been hereditary. The dofe of two drops is to be taken in a fmall quantity of water in the morning, fafting, or at night, going to reft, for two or three days together; then after an interval of as many days, proceeding as before. It generally produces its effect without any fenfible operation; except that in fome conftitutions it produces one or two motions.

Mr. Ward adminiftered two forts of fweating powders: one fort is directed to be made by rubbing together in a mortar four ounces of refined nitre, and as much vitriolized tartar, into a powder; and putting into a red-hot crucible half of this mafs, and ftirring it with an iron fpatula: when the red fumes that arife from it ceafe, put in the remainder of the matter, and ftir it till no more fumes arife; then pour it into an iron mortar; and when cool, add opium, ipecacuanha, and liquorice powder, of each an ounce: pound and fift them through a lawn fieve, and mix all together. When the powders are thus prepared, they fhould be fpread thin on white ftone difhes, and fet in a cool place for about two days, mixing them well, and fpreading them twice a day; then dry them before the fire, or with any other gentle heat.

The other fort of fweating powder is prepared by fulminating together common tartar, and refined nitre, of each one pound, in a crucible or iron pot, which will reduce them to about fifteen ounces: to thefe add white hellebore, and liquorice powder, of each fix ounces; powder them together, and fift them through a fine lawn fieve. The dofe is from twenty-five to fifty grains.

Thefe fweating powders are faid to remove rheumatic and other pains, occafioned by obftructions; though it is faid that the *red pill* has been found to anfwer better in ftubborn rheumatic cafes, and other fettled pains in the limbs. They may be taken in any liquid, going to bed between the blankets, and now and then drinking fome warm diluting liquor, as white wine whey, baum tea, &c. They may be repeated every other night at difcretion.

The *liquid sweat* is prepared by putting a gallon of good spirits of wine, and half a gallon of good white wine, into a strong bottle, and adding half a pound of saffron, four ounces of cinnamon, two ounces of salt of tartar, and one ounce of opium, cut into small pieces. Stop the bottle close, and set it near the fire for eight days, shaking it three or four times a day; then filter the contents through a filtering paper. The dose is from thirty to sixty drops, in a glass of good white wine.

The *paste* for the piles and fistulas is prepared by pounding separately a pound of elecampane root, three pounds of fennel-seeds, and one pound of black pepper, and sifting the powders through a fine sieve; then melt two pounds of honey, and two pounds of powder sugar, over a gentle fire, scumming them, till they become bright as amber: when they are cool, mix and knead your powder into them in the form of a soft paste. This paste is said to be a specific remedy for the fistula, piles, &c. The dose is the quantity of a nutmeg, morning, night, and noon, drinking after it a glass of water, or white wine.

The *dropsy purging powder*, as made by Mr. Ward, was formed by powdering separately jalap, cream of tartar, and Florentine iris, of each four ounces, and mixing them well; as prepared by M. D'Osterman for Mr. Ward, it consists of a pound of jalap in powder, a pound of cream of tartar, and an ounce of bole armoniac, in fine powder, mixed well together. The dose is from thirty to forty grains, in broth, or warm water, to be repeated two or three days successively, and longer, at proper intervals, if necessary.

The *essence for the head-ache* was formed by Mr. Ward of four ounces of spirits of wine, two ounces of camphor, and two ounces of volatile spirit of camphor, well mixed, and applied with the hand. M. D'Osterman prepared it for Mr. Ward, by putting two pounds of true French spirit of wine into a large strong bottle, and adding two ounces of roch alum in fine powder, four ounces of camphor cut small, half an ounce of essence of lemon, and four ounces of the strongest volatile spirit of sal ammoniac. Stop the bottle close, and shake it three or four times a day for five or six days. The method of applying it is, to rub a little of it gently upon the palm of the hand, and then holding it to the part affected till it is dry. If the pain is not relieved, it should be repeated two or three times.

For some remarks on Mr. Ward's pill and drop, by Mr. Clutton, see True and candid Relation of their good and bad Effects, and Med. Eff. Edinb. abr. vol. ii. p. 434. 470, &c. and Ed. Med. Ess. and Obs. vol. vi. p. 423.

WARD, in *Geography*, a township of Massachusetts, containing 540 inhabitants; 6 miles S. of Worcester.

WARD, a river of Denmark, in North Jutland, which runs into the North sea, 15 miles N.N.W. of Ripen.

WARD *Law*, a mountain of Scotland, in the county of Ayr; 16 miles E. of Ayr.

WARD'S *Creek*, a river of Virginia, which runs into James river, N. lat. 37° 10'. W. long. 77° 11'.—Also, a river of Maryland, which runs into the Chesapeak, N. lat. 38° 8'. W. long. 76° 52'.

WARDA ECCLESIARUM denotes the guardianship of churches; which is in the king during vacancies by reason of the regalia, or temporalities. See VACATION.

WARDAGE, WARDAGIUM, is sometimes used, in our ancient law-writers, in the same sense with wardpenny. Sometimes it also seems to denote a being free from wardship.

WARDAN, or *Ras Wardan*, in *Geography*, a cape on the coast of Arabia, in the Red sea; 5 miles S. of Masture.

WARDAN. See VARDEN.

WARDE, or VARDE, a town of Denmark, in North Jutland, on the river Ward. It was formerly a considerable city; but as the depth of its river, which abounds in fish, particularly salmon, is so much decreased, as to be no longer navigable for ships of burthen, it is fallen into decay. It has two churches; 18 miles N. of Ripen. N. lat. 55° 35'. E. long. 8° 28'.

WARDE *Mauger*, *La*, a town of France, in the department of the Somme; 4 miles W.N.W. of Montdidier.

WARDECORNE, among our *Ancient Writers*, a duty incumbent on the tenants, to guard the castle, by sounding a horn upon the approach of an enemy; called also cornage.

WARDEIN, in *Geography*. See PETER WARDEIN.

WARDEIN, *Gros*, a town of Hungary, on the river Koros, surrounded by good fortifications; the see of a bishop. The town itself is not large, but has three suburbs of very considerable extent. The adjoining fortress is a regular pentagon, well fortified, besides a deep and broad moat. Near the city is an excellent cold-bath; 66 miles N. of Temesvar. N. lat. 46° 53'. E. long. 21° 32'.

WARDEN, GUARDIAN, one who has the charge or keeping of any person, or thing, by office. See GUARDIAN.

Such is the warden of the Fleet, who is the keeper of the Fleet prison, and has the charge of the prisoners there; especially such as are committed from the court of chancery for contempt.

Such also are the warden of the fellowships, warden of the marshes, wardens of peace, warden of the west marshes, warden of the forest, warden of the alnage, warden of the king's wardrobe, &c.

WARDEN, in an university, is the head of a college; answering to what in other colleges we call the *master* thereof.

WARDEN, or *Lord Warden of the Cinque Ports*, is the governor of those noted havens; who has the authority of an admiral, and sends out writs in his own name. See CINQUE-*Ports*, and GUARDIAN.

WARDEN *of the Mint*, is an officer, whose business is to receive the gold and silver bullion brought in by the merchants; to pay them for it, and oversee the other officers. He is also called keeper of the Exchange, and Mint.

WARDENS, *Church*. See CHURCH.

WARDEN, *Renter*. See RENTER.

WARDEN *Ledge*, in *Geography*, a rocky shoal on the west coast of the Isle of Wight. N. lat. 50° 41'. W. long. 1° 23'.

WARDENBURG, a town of Germany, in the county of Oldenburg; 6 miles N. of Oldenburg.

WARDER, *Yeomen Warders of the Tower*, are officers, forty in number, who are accounted the king's domestic servants, and are sworn by the lord chamberlain: their duty is, to attend the prisoners of state, and to wait at the gates.

Ten of them are usually upon the day's wait, to take an account of all persons who come into the Tower; to enter their names, and the names of the persons they go to, in a book, to be perused by the constable or lieutenant.

WARDFEOH, or WARDFEGH, the value of a ward, or heir under age; or the money paid to the lord of the fee for his redemption.

WARD-HOOK, in *Gunnery*, the same with *wad-hook*, or worm.

WARDHUS, or WARDHUYS, or *Vardhuys*, in *Geography*, a town of Norwegian Lapland, and chief place of a govern-

government, defended by a castle, in which a governor resides, but without bastions; the town is chiefly inhabited by fishermen, and is situated on an island called Wardoe, the largest of three. N. lat. 70° 16′. E. long. 30° 28′.

WARDMOTE, in London, is a court so called, which is kept in every ward of the city; answering to the *curiata comitia* in ancient Rome.

WARDO, in *Geography*, a small island in the Baltic, E. of Aland, with a town. N. lat. 60° 15′. E. long. 20° 12′.

WARDPENNY, *Wardpeni*, was formerly a customary due paid to the sheriff, or other officer, for maintaining *watch* and *ward*.

It was payable at the feast of St. Martin; and is still paid within the manor of Sutton-Colfield, in Warwickshire; and that with some very singular ceremonies.

WARDROBE, a closet or little room adjoining to a bed-chamber; serving to dispose and keep a person's apparel in; or for a servant to lodge in, to be at hand to wait, &c.

WARDROBE, in a prince's court, is an apartment in which his robes, wearing apparel, and other necessaries, are preserved; under the care and direction of proper officers.

His majesty has a great wardrobe, a removing wardrobe, and divers standing wardrobes, belonging to his bed-chamber, in each of his palaces; *viz.* at Whitehall, Kensington, Windsor, Hampton Court, and the Tower; each under its respective keeper.

The removing wardrobe always attends on the king's person; as also on ambassadors, at christenings, masques, plays, &c. It is under the command of the lord chamberlain: the under-officers are, a yeoman, two grooms, and three pages.

The great wardrobe is of great antiquity. Anciently it was kept near Puddle-wharf, in a house purchased for that purpose by king Edward III.; but, after the fire of London, it was kept in York-buildings. The master or keeper of which is an officer of great dignity: high privileges were conferred on him by Henry VI.; and James I. enlarged the same, and erected the office into a corporation.

The officers are, the master or keeper, his deputy, and his clerk, besides several other officers; and above sixty tradesmen, all sworn servants to the king.

This office is to provide for coronations, marriages, and funerals, of the royal family; to furnish the court with beds, hangings, carpets, &c.; to furnish houses for ambassadors, at their first arrival here; presents for foreign princes and ambassadors; furniture for the lord lieutenant of Ireland, and our ambassadors abroad; robes for the knights and officers of the garter, heralds, pursuivants, ministers of state; liveries for the officers of the bed-chamber, and other servants; liveries for the lord-chief justices, and barons of the exchequer, and other officers in those courts; as also yeomen, warders, trumpets, kettle-drums, messengers, coachmen, grooms, &c. with coaches, harnesses, saddles, &c. the watermen, game-keepers; linen and lace for the king's person; tilts, &c. for his barges, &c.

WARDS. See COURT *of Wards*.

WARDSBOROUGH, *North District*, in *Geography*, a town of Vermont, in the county of Windham, containing 1159 inhabitants.

WARDSBOROUGH, *South District*, a town of Vermont, in the county of Windham, containing 894 inhabitants.

WARDSBRIDGE, a post-town of New York; 36 miles S. of Kingston.

WARDSHIP, in *Chivalry*. See GUARDIAN, in *Chivalry*, and WARD, supra.

WARDSHIP, in *Copyholds*, is incident only to those of inheritance. It partakes both of that in chivalry, and that in socage; like that in chivalry, the lord is the legal guardian, who usually assigns some relation of the infant tenant to act in his stead; and he, like guardian in socage, is accountable to his ward for the profits. See GUARDIAN.

WARDSHIP, in *Socage*. See GUARDIAN and SOCAGE.

WARD-STAFF, the constable's or watchman's staff.

The manor of Lambourn, in Essex, is held by service of the ward-staff; *viz.* by the carrying of a load of straw in a cart with six horses, two ropes, and two men in harness to watch the said ward-staff, when it is brought to the town of Abridge, &c.

WARDWAN, in *Geography*, a town of Hindoostan, in Guzerat; 80 miles S.W. of Amedabad.

WARD-WITE, compounded of the Saxon *ward*, *watch*, and *wite*, *mulct*, is defined by Fleta, as signifying a being exempted from the duty of watching. Others rather take it for a duty paid towards the charge of it.

WARE, *Sir* JAMES, in *Biography*, a descendant of an ancient English family in Yorkshire, was born at Dublin in 1594, and finished his education at Trinity college, Dublin. His proficiency was such as to entitle him to the particular notice of Dr. Usher, then bishop of Meath, with whom he contracted an intimate friendship. On his first visit to England in 1626, he was introduced by Usher to sir Robert Cotton, from whose library he derived much assistance in his researches; of which he again availed himself in a second journey to England in 1628. In 1629 he was knighted by the lords justices of Ireland, and in 1632 he succeeded to his father's estates, and to his office of auditor-general. He was greatly confided in and often consulted by the earl of Strafford, and by him made a member of the privy council. In 1639 he represented the university of Dublin in parliament, and was steadily attached to the interest of lord Strafford. He was active in his endeavours for suppressing the Irish rebellion which broke out in 1641, and he was held in such estimation by the marquis of Ormond, that he was one of three persons deputed by him to inform his majesty at Oxford, in December 1644, of the state of affairs in Ireland. On his return he was captured by a ship of war belonging to the parliament, and committed to the Tower, whence he was released by exchange. During the progress of the civil war, he was invariably attached to the royal cause, and when Dublin surrendered to the parliament, he was one of the hostages for the fulfilment of the treaty. After his return to Ireland, he was suspected, and ordered to depart to any place except England. He chose France as the place of his exile, and removed thither in 1649, and here he associated with men of learning. In 1651 he was allowed to come to London, and from thence he returned to Ireland, which was then in a tranquil state. During the embroiled state of the country, sir James Ware employed his time in the elucidation of historical antiquities, and published, at different periods, a variety of biographical and other works; and particularly his treatise "De Scriptoribus Hiberniæ," lib. ii. commencing with the introduction of Christianity into Ireland, and continued to the close of the sixteenth century; and also his principal work, entitled "De Hibernia et Antiquitatibus ejus," and first published in London in 1654, of which an enlarged edition appeared in 1658, with an

an appendix; "Rerum Hibernicarum regnante Henrico VII. Annales." His next publication was "A Collection of the Works afcribed to St. Patrick," 1656; and this was followed by "Two Epiftles of the Venerable Bede," and fome other ecclefiaftical pieces. In 1662 appeared at Dublin, fol. "Rerum Hibernicarum Annales, regnantibus Henrico VII., Henrico VIII., Edwardo VI., et Maria." His laft work, in 1665, was his "Complete Hiftory of Irifh Bifhops," comprehending his former narratives of them, under the title of "De Præfulibus Hiberniæ Commentarius, a prima Gentis Hibernicæ ad Fidem Chriftianam converfione ad Noftra ufque Tempora," Dub. fol.

Sir James Ware is denominated by Nicolfon the "Camden of Ireland," and highly commended both for his induftry and judgment. After the Reftoration he was reftored to his office of auditor-general, and in 1661 chofen reprefentative in parliament for the univerfity of Dublin; he was alfo appointed to fome other pofts under government, and he refufed the dignities of baronet and vifcount, though he manifefted his attachment to his country till his death in 1666. He left two fons and two daughters. After his death his works were collected by his fecond fon Robert, and publifhed in one folio volume in 1705; and a more complete edition was given by Walter Harris, efq. who married one of his defcendants, in 3 vols. fol.; printed at Dublin in 1739, 1745, and 1746. Biog. Brit.

Ware, in *Geography*, an ancient and populous market-town in the hundred of Braughin, and county of Hertford, England, is fituated on the weft fide of the river Lea, at the diftance of three miles E.N.E. from the county-town, and twenty miles N. from London. At the time of the Domefday furvey it was a fmall village, and was held by Hugh de Grentemaifnil, to whom it was given by the Conqueror, and from whofe family it paffed to Robert Blanchmains, earl of Leicefter. In the reign of king John, it defcended by marriage to Sayer, earl of Winchefter. "Before his time," fays Salmon, "a great iron chain was put acrofs the bridge, to prevent a road here to the difadvantage of Hertford. The bailiff of Hertford had the keys in his power; and no carriage with horfes or harnefs could go over without paying a toll to him, which toll was efteemed worth 10*l.* 13*s.* 4*d.* yearly. But the earl broke the chain, and laid the road open, which made this a great thoroughfare, brought trade to the town, and occafioned buildings in it." The high road to the north, which before went through Hertford, was now turned through this town. At a tournament held at Ware, 25 Henry III., Gilbert le Marefchal, the potent earl of Pembroke, was killed by falling from his horfe, and being trampled on; Robert de Say, one of his knights, was alfo flain in the diverfion, and feveral others were wounded. In 1408, the town was greatly damaged by a flood: its low fituation rendering it very liable to this inconvenience, feveral weirs and fluices have been raifed at different times to remedy it. There were anciently two religious eftablifhments in this town: one was a priory of Benedictines, fubordinate to the abbey of St. Ebrulph, at Utica, in Normandy, to which Hugh de Grentemaifnil granted the church of Ware: "Whereupon," fays Tanner, "it became a cell to that abbey; and in procefs of time was fo well endowed, that, upon the feizure of the alien priories by Edward III. this was farmed at 200*l.* *per annum*." Some remains of the priory buildings are yet ftanding at a little diftance from the church near the banks of the river: they chiefly confift of ancient walls fitted up and accommodated to the purpofes of a modern dwelling; a fmall obtufely-pointed arch, within the north-eaft angle of the building, is fupported by corbels difplaying the upper parts of human figures; one of which appears to be clad in mail. The other eftablifhment, which ftood in the north part of the town, was for Grey or Francifcan friars; but by whom, or when founded, is uncertain. The town of Ware at prefent confifts of one principal ftreet, a mile in length, interfected by feveral fmaller. In the return of the year 1811, the population is ftated to be 3369, occupying 687 houfes. Confiderable traffic is carried on in corn and malt, which are conveyed to the London markets by the river Lea and the new navigable canal: the barges load back with coals and other articles. A weekly market, granted in the reign of queen Elizabeth, is held on Tuefdays; and two fairs annually. At an inn in this town was formerly a remarkable bed, twelve feet fquare, called the Great Bed of Ware; it is faid to be of remote antiquity, but its origin is not mentioned in hiftory. Ware church, a fpacious edifice, confifts of a nave, chancel, and aifles, with an embattled tower at the weft end. The inner roofs are of timber, and have been ornamented with paintings and infcriptions, of which there are ftill confiderable remains; particularly in the fouth chancel or chapel, where the roof is divided into fquares, in each of which is fome figure or legendary fubject. The fepulchral memorials are numerous, among which are various ancient flabs, moft of which have been pillaged of their braffes. The font is ornamented with various fculptures, reprefenting St. George, and other fubjects. At the weft end of the church is a handfome gallery, erected by the governors of Chrift's hofpital, London, for the ufe of the fchool that was formerly eftablifhed here for the younger children of that inftitution, but which has been many years removed to Hertford. Among various benefactions for charitable purpofes are feveral well-endowed alms-houfes, eftablifhed in different parts of the town. In a piece of ground called the Bury-field, at the fouth-weft corner of Ware, in February and March, 1802, at about the depth of three feet, were found four ftone coffins, each of them formed of one mafs of ftone, hewn with tolerable fquarenefs: each lid was alfo of one piece. At a fpot, called Lemonsfield, were dug up, in 1729, feveral Roman veffels of reddifh earth, &c. At Roadmill are the remains of a Roman camp.

Ware-park, the feat of Thomas Hope Byde, efq. is fituated on an eminence, commanding the rich meadows which extend between Ware and Hertford. The ancient manor-houfe, which had been the retirement of the Fanfhaws, and the occafional refidence of their predeceffors in the poffeffion of the manor, was pulled down by Thomas Byde, efq.; and a new manfion erected on the acclivity of a hill. This is elegantly fitted up, and forms the prefent refidence of the family; the park and grounds are well diverfified, and are rendered extremely pleafant by the contiguity of the rivers Lea and Rib. Sir Richard Fanfhaw, a diftinguifhed ftatefman in the feventeenth century, was born in the old manor-houfe in 1607, and was interred in Ware church in 1666.

In the meadows oppofite to Ware-park, on the fouth-eaft, are the fprings of Chadwell, the proper fource of the New River. Thefe are concentrated in a fmall pool or bafin, furrounded by a light railing, from which the ftream flowly iffues in its courfe towards London, and is fwelled at a fmall diftance by a cut from the river Lea. See New River.—Beauties of England and Wales, vol. vii., Hertfordfhire; by E. W. Brayley, 1808. Salmon's Hiftory of Hertfordfhire, fol. 1728.

Ware, a town of Maffachufetts, in Hampfhire county, containing 996 inhabitants; 15 miles N.E. of Springfield.

Ware, a river of Maffachufetts, which runs into the Connecticut, at Springfield.—Alfo, a river of Virginia, which

which runs into the Chesapeak, N. lat. 37° 25′. W. long. 76° 26′.

WARE, *Earthen*, *Queen's*, and *Stone*. See POTTERY.

WARE-*Sea*. See SEA-*Ware*.

WARECTUM, in *Ancient Writings*, signifies land that has lain long neglected, and untilled.

In ancient records, we meet with *tempus warecti*, for the time in which land lies fallow, or else the season of fallowing.

WAREE, in *Geography*, a town of Africa: capital of a country of the same name; 60 miles S. of Benin. N. lat. 5° 25′. E. long. 4° 48′.—Also, a country of Africa, near the west coast, south of Benin.—Also, a town of Hindoostan, in Guzerat; 50 miles W. of Radunpour.

WAREHAM, a borough and market-town in the hundred of Winfrith, Blandford south division of the county of Dorset, England, is situated on a peninsula, formed by the rivers Frome and Piddle, near their confluence with the waters of Poole harbour, at the distance of 18 miles E.S.E. from Dorchester, and 110 miles S.W. by W. from London. It appears to have been a British town, from its earthen vallum, and from the barrows in its vicinity; and that the Romans had a station here is evinced, by a military way which proceeds immediately hence to Dorchester, and by Roman coins found in the neighbourhood. Mr. Baxter and other antiquaries consider it to have been the *Morinio* of Ravennas and Richard of Cirencester. Wareham was a place of some consequence in the time of the Saxons; but was made a theatre of war by the Danes for a century and a half; in which period its principal notoriety arose from its misfortunes and desolation. In the reign of Athelstan it had recovered so much importance, that the king appointed it to have two mints and mint-masters; a greater proportion than any town in the county possessed, except Shaftesbury. Here also Edward the Martyr was privately buried, after his assassination at Corfe castle; though within three years his body was removed to Shaftesbury abbey. In the year 998, Wareham was visited by the Danes; and likewise in 1015, when Canute entered the Frome, and ravaged the adjacent country. It seems to have been the constant practice of these pillagers, when the invasion of the western counties was their object, to make this town their head-quarters; so that it was in a state either of continual apprehension or of absolute warfare. In Domesday-book, it is described as being in a desolate state in the time of Edward the Confessor: after the conquest, it gradually became of greater importance; but from the year 1138 to 1146, it was a scene of confusion and war, arising from the contentions between king Stephen and the empress Maud, during which the town and castle were burnt. From this period scarcely any thing important occurred in Wareham, till the civil war in the reign of Charles I., when it was early fortified for the parliament; but in a short time it was possessed by the king: it was afterwards again taken by the parliamentary forces, who relinquished on the surrender of Corfe castle. On the 25th of July 1762, Wareham experienced a dreadful calamity, in a fire which broke out nearly in the centre of the town, and spread with such violence and rapidity, that in three hours two-thirds of the town were reduced to a heap of ruins: 133 dwelling-houses, with the town-hall and other buildings, were destroyed; and the loss, exclusive of insurance, was estimated at 10,000*l.* The subscriptions for the relief of the sufferers did honour to the nation, and the town rose out of its ashes to greater advantage than before. Wareham is built in a flat country, and forms a long square: the buildings, which are chiefly constructed of brick, are disposed in four spacious streets, intersecting each other at right angles. The area on which it stands is computed at an hundred acres, and is inclosed, except on the south side where the Frome runs, by a high rampart or bank of earth, which was cast up by the Danes in the ninth century, and measures 5360 feet. The space between the bank and the town was anciently occupied by houses, the foundations of which still remain. At present it consists chiefly of extensive garden grounds, divided into regular quadrangles, the scites of ancient streets; the holders of these grounds are entitled to vote for members for the borough. These gardens produce vast supplies of vegetables, considerable quantities of which are sent by water to Poole and Portsmouth. The soil is favourable for the cultivation of hops, which grow wild and luxuriant in the hedges and fields. This town was anciently a borough by prescription, and is so styled in Domesday-book. By a charter of queen Elizabeth, the government of the town was vested in a mayor, six burgesses, and other corporate officers; but, from some peculiar circumstances, these privileges were neglected, and became obsolete. The mayor, by prescriptive right, is coroner of the town, and of the isles of Purbeck and Brownsea: this right is still claimed and exercised. By a charter of the second year of queen Anne, the town is incorporated by the style of "the mayor, the capital, and assistant burgesses;" and, among other privileges, is empowered to have a gaol and house of correction; and to hold three fairs, and a court of pie-powder; the profits of the fairs and courts to be for the sole benefit of the mayor. A weekly market is held on Saturdays. Two members have been returned to parliament ever since the 13th of Edward I. The right of election was anciently vested in four burgesses; but in the year 1747 it was determined to be in the mayor and corporation, jointly, with such inhabitants as paid scot and lot, together with such freeholders who hold lands in their own occupation, or by descent, marriage-settlement, or promotion in the church. Wareham had formerly eight churches, of which only three remain. Trinity is reputed the mother-church, but does not contain any thing remarkable. St. Martin's is an ancient structure, neatly fitted up: St. Mary's is a lofty fabric, and with the exception of Sherborne and Wimborne, the most spacious and ancient in the county; in the south aisle is a chapel, said to be the burial-place of the Saxon kings; within it is a neat mural pyramidical monument, to the memory of the Rev. John Hutchins, rector of Wareham, and author of the History and Antiquities of Dorsetshire. The building that was formerly St. Peter's church is now used as a town-hall, school-house, and gaol. This parish is singular for a house in the market-place, called *Homo cum cane*, the owner of which is always a tithing-man, and obliged to attend at the wool-court, twice a year, with a one-eyed bitch. Here are two meeting-houses for Dissenters, a free-school, a charity-school, and an alms-house: the latter founded by John Streche, esq. of Exeter, and rebuilt, in 1741, by Henry Drax, esq. and John Pitt, esq. The priory, situated on the river side, near St. Mary's church, is one of the most ancient in the county: it is said to have been founded by Adhelm, bishop of Sherborne, who died in 709; and appears to have been a nunnery antecedent to 876, when, together with the town, it was destroyed by the Danes. Robert Bellamont, earl of Leicester, changed it into a convent for monks, subject to the Benedictine abbey of Lira, in Normandy. At the dissolution of alien-houses, it was bestowed on the Carthusian monastery of Shene, in Surrey; and on the general dissolution of monasteries, it shared the common wreck of those monuments of religious splendour. By various descents, it is now the property of lord Rivers. In a close, denominated Castle close,

close, formerly stood the castle, of which no remains are now visible: it was famous for the imprisonment and death of Robert de Belesme, earl of Montgomery, who, for rebelling in the year 1114 against Henry I., was doomed to the most rigid confinement in this castle, where he starved himself to death. The port of Wareham was formerly considerable; but, owing to the shallowness of the shore, and the retreat of the sea, it is nearly choaked up; though at very high tides the water flows up to Holm bridge, nearly five miles. It had anciently a court of admiralty belonging to it: the quay lies on the south side of the town, but the trade is now very inconsiderable; it chiefly consists in the exportation of pipe-clay, vast quantities of which are obtained from the clay-pits round the town; and nearly 10,000 tons are annually shipped for London, Hull, Liverpool, Glasgow, &c. for the use of the potteries. This clay is particularly useful in the composition of Staffordshire ware; the digging it employs many hands. According to the population return of the year 1811, the inhabitants of Wareham were 1709, occupying 383 houses. South Bridge, which, crossing the Frome, connected this town with the isle of Purbeck, was an ancient structure, probably coeval with William Rufus; but being ruinous was presented at the Easter sessions for the county in 1775. A handsome bridge of Purbeck stone has been since erected, having five arches, the expence of which amounted to 2932*l.* 10*s.* The salmon fishery on the Frome anciently belonged jointly to the abbey of Bindon: the hoop-net, or weir, for taking the salmon, was fixed in the Wareham royalty for several centuries; and its antiquity appears from various grants. The fishery is now held by Thomas Weld, of Lullworth, and John Calcraft, esqrs.—Hutchins's History of Dorsetshire, 4 vols. fol. 1796. Beauties of England and Wales, vol. iv. Dorsetshire; by J. Britton and E. W. Brayley, 1803.

WAREHAM, a town of the state of Massachusetts, in the county of Plymouth, on a river which runs into Buzzard's Bay, containing 851 inhabitants; 35 miles S.S.E. of Boston.

WAREM. See BORCHWORM.

WAREN. See WARREN.

WAREN, in *Geography*, a small island in the North sea, near the coast of Lapland, but the principal of a group. N. lat. 66° 48′.

WARENDORFF, a town of Germany, in the bishopric of Munster, on the Ems; 12 miles S.E. of Munster. N. lat. 51° 52′. E. long. 8° 6′.

WARENDORP, a town of the duchy of Holstein; 6 miles W.S.W. of Cismar.

WARESTAS, a small island on the east side of the gulf of Bothnia. N. lat. 60° 43′. E. long. 21° 4′.

WARGAM, a town of Hindoostan, in Guzerat; 45 miles S. of Gogo.

WARGELA, a town of Africa, in Sahara; 250 miles N.W. of Agades. N. lat. 23° 35′. E. long. 9° 50′.

WARGEN, a town of Prussia, in Samland; 6 miles W.N.W. of Konigsberg.

WARGENTIN, PETER WILLIAM, in *Biography*, an eminent Swedish astronomer, was the son of a clergyman, and born in Yamtland in 1717. In his earlier years he made rapid proficiency in the learned languages and in mathematics, and in those other branches of learning which were adapted to his original destination for the church. In 1733 he was admitted at the academy of Upsal, where he enjoyed peculiar advantages under Klingenstierna and Celsius for pursuing his favourite studies of mathematics and astronomy; gaining, after the death of his father, the means of subsistence by the instruction of private pupils. The subjects of his disputations, preparatory to his degree of master of arts, which he obtained in 1743, were the satellites of Jupiter, and the political system of Machiavel. His views were directed in the course of his studies to the office of lecturer in mathematics in the gymnasium of Hernösand, and this object he succeeded in attaining. Having calculated new tables of Jupiter's satellites, which were inserted in the transactions of the society of Upsal for 1741, he was chosen a member of that body. After the death of Celsius, he commenced a correspondence with some of the French astronomers, and in 1743 was nominated a member of the Academy of Sciences at Paris. In 1749 he was chosen successor to Elvius, as secretary to the Academy of Sciences at Upsal, the duties of which office he discharged for 34 years. Wargentin's tables for the satellites of Jupiter, published in 1741, were much approved by all foreign astronomers; and in 1742 he communicated, in the transactions of the society of Upsal for 1742, more than 1000 observations made by various astronomers, which he compared with his tables, and the result of the comparison was, that the difference seldom amounted to a minute, and for the most part to less. In the same transactions for 1743, he inserted about 400 observations of the other satellites, which, compared with the tables, gave a difference that seldom amounted to four minutes of time, but for the most part to less. From this time he directed his attention to the improvement of the theory of Jupiter and his moons, and to the perfection of his tables. He was thus led to revise them to the year 1753; and when his tables of the four satellites were completed, he transmitted a copy of them to M. de la Lande, by whom they were inserted, in 1759, in a new edition of Halley's tables, published at Paris. In 1769 he sent a copy of them, further improved, to Dr. Maskelyne, who published them in the Nautical Almanack for 1771. They were again published, with improvements by De la Lande, together with his own astronomical tables; and another edition of them, with some variations from the last edition of Paris, appeared at Berlin in 1776. The result of Wargentin's assiduity in this department of astronomy was communicated to the public in the "Connoissance du Mouvements Celestes" for 1766, the "Nautical Almanack" for 1771 and 1779, and the "Astronomiches Jahr-buch" for 1777, 1779, 1781, and 1782: and the fruits of his last labour in these tables appeared in the fourth volume of the "Nova Acta Societatis Literariæ Upsaliensis," which contained 1250 observations of the third satellite, with appropriate remarks. This indefatigable astronomer contributed to the transactions of the Royal Academy of Sciences papers on different subjects, amounting to the number of sixty. All these papers, besides several others, and one written in 1744, on the velocity of the rays of light, were produced by him after he became secretary to the academy. Many of them "relate to the history of the sciences; such as on thermometers, and the best sorts of them; on the attempt made to determine the real figure of the earth; on the parallax of the fixed stars, and the experiment made to discover it; on logarithms; on the flux and reflux of the sea; on comets; on the use of ventilators on board ships; and on the northern lights." Some of them treat of climate and its differences, in reference to which he observes in general, "that milder and colder winters, summers more or less warm, earlier or later springs and autumns, depend not only on the greater or less degree of latitude of the place, but also on other circumstances, such as the vicinity of the sea, lakes, marshes, large woods, uninhabited deserts, &c. from which he deduces this conclusion, that the climate of Sweden is much more temperate than many others lying under

under the ſame parallel." On parallaxes and tranſits he alſo made a variety of obſervations, which were publiſhed in the tranſactions of the different ſocieties to which he belonged. The phenomena of the magnet and of the northern lights were alſo objects of his attention; and he ſuggeſted that ſome connection ſubſiſted between them, and that the variations of the magnetic needle are violent in proportion to the intenſity of the lights. He likewiſe furniſhed the Academy of Sciences, and alſo our ingenious traveller, Mr. Coxe, with tables and obſervations relating to births and deaths, as well as to population in general, not only in Stockholm, but in various other places.

In ſketching his character, one of his biographers ſays, that "he was a man of great integrity, modeſt and friendly in his diſpoſition; zealous for the advancement of ſcience, and ever ready to make any ſacrifice which could tend to promote the good of his country." His merit induced king Adolphus Frederick to create him, in 1759, a knight of the Polar Star; and he was a fellow of the Royal Society of London, and member of the Academies of Peterſburgh, Paris, Gottingen, Copenhagen, and other learned inſtitutions. Although his genius was not brilliant, his judgment was ſound and diſcriminating, and his labour, induſtry, and perſeverance, were indefatigable. Notwithſtanding the intenſeneſs of his application, which allowed him few intervals of relaxation and amuſement, his habits were regular and temperate, and ſerved to prolong his life to an advanced period. Towards the cloſe of it, however, his ſight and hearing decayed; but neither his ſtrength nor ſpirits ſeemed to decline till the ſummer of 1783, when a diabetes, which baffled all medical ſkill, carried him off in the month of December in that year. His papers on a variety of ſubjects occur in the following volumes of the Philoſophical Tranſactions, *viz*. xlvii. lii. liii. lvi. lviii. lix. lxv. and lxvii. Coxe's Travels in Sweden, &c. vol. iv. Gen. Biog.

WARGO, in *Geography*, a ſmall iſland in the gulf of Bothnia, near the eaſt coaſt. N. lat. 63° 0′. E. long. 20° 57′.—Alſo, a ſmall iſland on the weſt ſide of the gulf of Bothnia. N. lat. 65° 17′. E. long. 21° 47′.

WARGOCZYN, a town of Poland; 40 miles N.W. of Lublin.

WARGRAVE, a town or populous village of England, in Berkſhire, on the right bank of the Thames; 7 miles N.E. of Reading.

WARI, a town of Hindooſtan, in Baglana; 28 miles E. of Babbelgong.

WARIANAGUR, a town of Hindooſtan, in the Carnatic; 16 miles S. of Tiagar.

WARIBA, a river of Guiana, which runs into the Atlantic, N. lat. 6° 54′. W. long. 59° 8′.

WARIGARI BAY, a bay on the iſland of St. Vincent, ſouth of Hungary Point.

WARIN, a town of Mecklenburg; 10 miles S.E. of Wiſmar.—Alſo, a river of Braſil, which runs into the Atlantic, S. lat. 4° 55′. W. long. 36° 58′.

WARING, EDWARD, M. D., in *Biography*, deſcended from an ancient family at Milton, in the county of Salop, was born in 1734, and finiſhed his education at Magdalen college, Cambridge, where he was conſidered, when he took his firſt degree in 1757, as a prodigy in thoſe ſciences which form the ſubject of the bachelor's examination. At the age of 25 years, in 1759 he was elected Lucaſian profeſſor of mathematics, not without giving offence to ſome of the ſenior members of the univerſity, who diſapproved the appointment of ſo young a man to occupy a chair which had been dignified by a Newton, a Saunderſon, and a Barrow; and the firſt chapter of his "Miſcellanea Analytica," which was circulated in vindication of his ſcientific character, was the occaſion of a controverſy of ſome continuance. The attack was commenced by Dr. Powell, maſter of St. John's, and the young profeſſor was ably defended by Mr. Wilſon, afterwards judge Wilſon, a gentleman held in high eſtimation. In 1760, Waring received the degree of maſter of arts by royal mandate; and in 1762, his "Miſcellanea Analytica" was publiſhed, with a dedication to the duke of Newcaſtle. This work amply vindicated his early elevation to the profeſſorſhip, and extended his ſcientific fame through Europe; ſo that he was elected member of the ſocieties of Bologna and Gottingen, and honoured by expreſſions of high regard by the moſt celebrated mathematicians, both at home and abroad. Speaking of this miſcellany, comprehending moſt ſubjects in pure mathematics, he himſelf ſays, "In my preface I have given a hiſtory of the inventions of different writers, and aſcribed them to their reſpective authors, and likewiſe ſome account of my own. To every one of theſe ſciences I have been able to make ſome additions, and in the whole, if I am not miſtaken in enumerating them, ſomewhere between 300 and 400 new propoſitions of one kind or other, conſiderably more than have been given by any Engliſh writer; and in novelty and difficulty not inferior; I wiſh I could ſubjoin, in utility. Many more might have been added, but I never could hear of any reader in England out of Cambridge, who took the pains to read and underſtand what I have written. But I muſt congratulate myſelf that D'Alembert, Euler, and La Grange, three of the greateſt men in pure mathematics, of this or any other age, have ſince publiſhed and demonſtrated ſome of the propoſitions contained in my 'Meditationes Algebraicæ,' or 'Miſcellanea Analytica,' the only book of mine they could have ſeen at that time; and D'Alembert and La Grange mention it as a book full of excellent and intereſting diſcoveries in algebra. Some other mathematicians have inſerted ſome of them in their publications. The reader will excuſe my ſaying ſo much, there being ſome particular reaſons which influenced me." Medicine alſo engaged our author's attention, and in 1767 he took his degree of doctor; but though he took pains by attending lectures and hoſpitals in London to perfect himſelf in the medical art, it does not appear that he ever gained much practice. His manner, it is ſaid, was not very prepoſſeſſing; but his want of ſucceſs he had the leſs reaſon to regret, as he had a very liberal patrimony, and as he was ſufficiently amuſed by his favourite ſcience. He reſided for ſome time at St. Ives, after taking his doctor's degree, and in 1776 he married; but as the air of Cambridge, whither he removed, did not agree with Mrs. Waring's conſtitution, he went to live on his own eſtate at Plaiſly, about eight miles from Shrewſbury, and proſecuted his mathematical inquiries. He alſo directed his attention to other ſubjects, and printed at Cambridge, in 1796, a work entitled "An Eſſay on the Principles of Human Knowledge," which was never publiſhed. Attached to his country retreat he ſeldom left it, except when he occaſionally attended the Board of Longitude in London, of which he was a member. A violent cold terminated in his death, which happened in Auguſt 1798, in the 64th year of his age. His integrity was inflexible, his modeſty diſguiſed the ſuperiority of his underſtanding, and his habits and manners were ſimple and plain.

In the extract we have given from his own account of his writings, ſome may ſuppoſe that he incurs the charge of vanity and ſelf-adulation; but occaſions may occur in which the moſt modeſt men are called upon to do themſelves juſtice, which was the caſe with regard to Dr. Waring. To ſay nothing of the diſparaging reflections which his early appointment

pointment to the Lucasian profesforship produced, he was induced, for the honour of his country, to retort to the charge of Lalande, the French astronomer, who, in his life of Condorcet, asserts, that in 1766 there was no first-rate analyst in England. In order to repel this accusation, he takes occasion, in a letter to Dr. Maskelyne, to mention with respect the writings of several celebrated British mathematicians, two of whom were living in 1764, and then to take notice of his own discoveries, many of which had been published before that year; it should be remembered, that this account was not published by himself. It is not without reason that he intimates the neglect with which his writings were treated; the fact is certain, and it was owing partly to the abstrusenefs of the subjects, but principally to the perplexed style and manner in which they are discussed. His principal works, besides those that have been mentioned, are "Meditationes Algebraicæ," 1770; "Proprietates Algebraicarum Curvarum," 1772; and "Meditationes Analyticæ," 1773, 1774, 1775, 1776. His papers in the Philosophical Transactions may be found in vols. liii. liv. lv. lxix. lxxvi. lxxvii. lxxviii. lxxix. lxxxi. lxxxiv. For these communications he was honoured with sir Godfrey Copley's medal. Nichols's Anecd. of the 18th century. Gen. Biog.

WARING, in *Geography*, a town of Virginia; 15 miles E.S.E. of Port Royal.

WARINGSTOWN, a town of the county of Down, Ireland, about 3 miles from Lurgan, where the linen manufacture is extensively carried on; 67 miles N. from Dublin.

WARISE, a town of France, in the department of the Moselle; 4 miles S. of Boulay.

WARKA, a town of the duchy of Warsaw. In 1656, the Poles were defeated here by the Swedes; 30 miles S. of Warsaw.

WARKALLEN, a town of Prussian Lithuania; 4 miles N. of Gumbinnen.

WARKULLEN, a mountain of Sweden, in the province of West Gothland, from which may be fcen 23 lakes, great and small.

WARKWORTH, a market-town in the east division of Morpeth ward, and county of Northumberland, England, is situated on the banks of the river Coquet, distant 7 miles S.E. from Alnwick, and 305 miles N. by W. from London. It consists chiefly of one principal street; and in the population return of the year 1811 is stated to contain 108 houses, and 568 inhabitants; the latter are mostly employed in taking and curing salmon. A weekly market is held on Thursdays; and three fairs annually. Warkworth is a borough by ancient prescription, and is governed by a mayor chosen by the free burgesses. In the centre of the town is the market-place, having a stone cross inclosed in a spacious area. The church exhibits some remains of ancient architecture, and has a spire one hundred feet in height. Adjoining to the church was formerly a cell for two Benedictine monks from Durham, for whose maintenance here Nicholas de Farnham, bishop of Durham, who died A.D. 1257, appropriated the church of Brankeston, which was confirmed by Walter de Kirkham, his successor. Over the Coquet is a stone bridge of three arches; on the middle of it is a pillar, and at its south end an ancient tower. At the south end of the town is Warkworth castle, the ancient residence of the earls of Northumberland: in Leland's time it was, he says, "well menteyned;" but in 1672 its timber and lead were granted to one of their agents, and the principal parts of it unroofed. It contains within its moat above five acres. The whole stands on a rock, and its walls were well guarded with towers. The keep is square, with the angles canted off, and having at the middle of each side a projecting turret, semi-hexagon at its base, and of the same height as the rest of the structure. It contains a chapel, and a variety of spacious apartments, and is finished with a lofty watch-tower, commanding an almost unbounded prospect. Half a mile above the castle is the Hermitage of Warkworth, celebrated in 1771, by the late bishop of Dromore, in his ballad of the "Hermit of Warkworth." It was only for one priest or hermit, but its origin and foundation are uncertain. The earl of Northumberland, in his grant to the last hermit in 1572, calls it "min armitage, belded in a rock of stone, in my parke, in honour of the Holy Trinity." The most perfect and curious part of it consists of a chapel, sacristy, and vestibule, hewn out of a fine freestone-rock, twenty feet high, and overshadowed with shrubs and stately forest trees. The chapel is about eighteen feet long, and seven feet broad and high; and executed with great neatness, in columns, groins, and arches, in the old style. Parallel with the chapel, five feet wide, and stretching five feet round its west end, is the sacristy, lighted from the chapel with a window, and having the remains of an altar in it, and over its door a shield, with instruments of the Passion. Its west end communicates with the vestibule, in which are two square niches, and from which has been a way into an apartment of masonry, having remains of a chimney. A staircase led from the chapel door to the top of the cliff, where were the hermit's house and garden.—Beauties of England and Wales, vol. xii., Northumberland; by the Rev. J. Hodgson, 1813. History and Antiquities of Northumberland; by Nicholson and Burn, 2 vols. 4to.

WARLAX, a small island on the east side of the gulf of Bothnia. N. lat. 63° 18′. E. long. 21° 29′.

WARLEY, a township of the West Riding of Yorkshire; 3 miles N.W. of Halifax.

WARMBRUNN, a town of Silesia, in the principality of Jauer, celebrated for its warm baths; 3 miles S.S.W. of Hirschberg.

WARMELAND, a province of Sweden, bounded on the north by Norway and the province of Dalecarlia; on the east by Westmanland and Nericia; on the south by the Wenner Lake; and on the west by Norway; about 200 miles in length from north to south, and 130 in breadth from east to west. This country is almost every where mountainous; but the east and south parts are more level and fertile than the west and north parts. However, the woods and mines of silver, lead, copper, and iron, with the forges, founderies, &c. belonging to them, furnish the inhabitants of the latter with a great variety of employments. In the year 1726, some pure silver was found in an iron mine not far from Philipstadt, and the memory of this extraordinary circumstance has been preserved in some medals struck on the occasion. The chief occupation of the inhabitants is mining, smelting, &c. together with fishing, and a little agriculture. Their trade consists mostly in masts, planks, timber, the bark of birch-trees, &c. The chief river in this province is the Clara, or Stor Elbe, in which there is a very profitable salmon-fishery. The principal lake, besides the Wenner, is the Fry-ken, which is eight Swedish miles in length, but narrow: it has communication with the Wenner lake.

WARMENSTEINACH, a town of Germany, in the principality of Culmbach; 9 miles E.N.E. of Bayreuth.

WARMINSTER, a considerable market-town, of antiquity, in the hundred of the same name, and the county of Wilts, England, is situated near the western confines of the county, at the distance of 20 miles W.N.W. from Salisbury,

bury, and 98 miles W.S.W. from London. At the time of the Conqueſt, Warminſter appears to have been exempted from the payment of taxes, which circumſtance, together with the evident derivation of its name, ſeems to point it out as the ſcite of an ancient monaſtery. At a later period it was celebrated for its corn-market. Leland, in his Itinerary, ſays, "Werminſter, a principall market for corne, is 4 myles from Brookehaulle, a myle to Weſtbury, and ſo 3 myles forthe." At the preſent day, the market of this town continues to be abundantly ſupplied with wheat, barley, oats, &c. and here are three annual fairs. Warminſter poſſeſſes no corporation within itſelf, and is therefore under the government of the neighbouring county magiſtrates, with the aid of conſtables choſen every year, at the court-leet of the marquis of Bath, who is lord of the manor. The chief trade carried on here is that of malting, and a conſiderable manufacture of woollens: the latter has been rapidly on the increaſe within the laſt century. According to the parliamentary returns of the year 1811, the town and pariſh of Warminſter contained 1073 houſes, and a population of 4866 perſons. The houſes in the town are principally ranged in one very long ſtreet, ſtretching along the ſides of the turnpike-road. At the weſtern extremity ſtands the pariſh-church, which is a ſpacious edifice of ſtone, with a ſquare tower; and near the centre of the town is a chapel of eaſe, erected ſome years ago for the convenience of the pariſhioners. There are beſides two places of worſhip belonging to the Diſſenters; alſo a good market-houſe, an aſſembly-room, and a free grammar-ſchool for the education of twenty poor boys. This inſtitution is endowed with a ſalary of thirty pounds *per annum*, and is in the gift of the marquis of Bath. The lordſhip of Warminſter in ancient times formed part of the eſtate of the family of Mauduit, whence it paſſed to the Hungerfords. Mary, an heireſs of that family, conveyed it by marriage to Edward, lord Haſtings, who was beheaded by order of the duke of Glouceſter, afterwards Richard III. That monarch ſubſequently beſtowed it on John Howard, whom he created duke of Norfolk. It is now the property of the marquis of Bath. Dr. Samuel Squire, a learned writer, and biſhop of St. David's, was born at Warminſter in 1714, and died in 1766.

Southley Wood, ſo called from its lying to the ſouth of Warminſter, is diſtinguiſhed by a ſmall intrenchment, denominated Robin Hood's Bower, which is nearly of a ſquare form, and compriſes about three-quarters of an acre. Cloſe to the eaſtern boundary of this wood is another ſimilar earthen-work; and on its eaſtern ſide is a third intrenchment, reſembling an amphitheatre in miniature. This laſt is a very curious work, and conſiſts of a ditch and two vallas. The outer vallum is about eighteen feet in height, and is very neatly formed; the breadth of the ditch is ſeven feet; the height of the inner work from fifteen to ſixteen feet; and the length of the area of the inner work on its longeſt ſide (for it is of an oval ſhape) is one hundred and eleven feet.

Clee or Clay Hills, in this vicinity, are two very ſingular knolls; one of which is much larger than the other, and is ſurrounded by a ditch and rampart, bearing the marks of very high antiquity; and on its ſummit are placed two barrows, and the pedeſtal of a ſtone croſs. Both theſe tumuli were opened by ſir Richard Hoare, who aſcertained one of them to be decidedly ſepulchral; but no remains of any interment appearing in the other, it is ſuppoſed to be deſigned for a beacon.

At the diſtance of a quarter of a mile N.E. from Warminſter, is a conical-ſhaped eminence, called Cop-Head Hill, which is crowned by a large barrow, encircled by a ditch and vallum. This tumulus was opened in 1809 by ſir Richard Hoare, and found to contain the ſkeletons of ſeveral males, one female, and a child; beſides an interment of burnt bones.

About three-quarters of a mile further to the eaſtward, on the ſummit of an irregular hill, is Battleſbury Camp: on the weſt and north-eaſt ſides it is nearly inacceſſible, from the ſteep and difficult nature of the ground; and on thoſe ſides where it is more eaſily approached, additional ramparts have been conſtructed exterior to the double ditch and vallum which ſurround the whole. The circuit of the outer vallum is ſeven furlongs and ſixty-ſix yards, and the greateſt height of the ramparts is ſixty feet: the area, within the interior vallum, meaſures twenty-three acres and a quarter, and is wholly under tillage. At the ſouth-weſt angle of the camp are three barrows: one of them fills the entire ſpace of the inner ditch; and the other two are placed in the line of the inner rampart. Theſe laſt, on opening, proved to be ſepulchral; but no interment could be diſcovered in the other.

Between this fortreſs and the village of Boreham, is one of the largeſt barrows in Wiltſhire, from which circumſtance it has been dignified with the appellation of King Barrow. It extends two hundred and ſix feet in length, fifty-ſix in breadth, and from fifteen to ſixteen in height. When firſt opened in 1800 by Mr. Cunnington, the ſkeleton of a horſe, and three of human beings, were diſcovered, together with ſome pieces of ſtags' horns, boars' tuſks, and rude pottery; alſo a ſingle-edged iron ſword, about eighteen inches in length, and two in breadth, which lay on the thigh of one of the ſkeletons.

Weſtward from Warminſter four miles and a half, on the immediate confines of this county with Somerſetſhire, is Longleat, the magnificent ſeat of the marquis of Bath. The old houſe was originally part of a priory, founded by ſir John Vernory, lord of Horningſham. On its ſurrender to Henry VIII. the ſcite and lands attached were granted to ſir John Horſey, and Edmund, earl of Hertford, from whom the whole was afterwards purchaſed by ſir John Thynne, an anceſtor of the preſent proprietor. Towards the cloſe of his life he laid the foundation of the ſuperb manſion, which ſtill continues the proudeſt architectural ornament of this part of Wiltſhire; but he only lived to finiſh the ſhell and a ſmall portion of the interior. The remainder was completed by his ſon and by his grandſon; the latter of whom was created lord Weymouth by king Charles II. This nobleman likewiſe furniſhed the houſe in a moſt ſplendid manner. His lordſhip died in 1714; the third lord, who was afterwards raiſed to the dignity of marquis of Bath, new-modelled the gardens and grounds by the advice of the celebrated Brown, whoſe plan his lordſhip unremittingly purſued till his death, which happened in 1796. The ſituation of Longleat is peculiarly fine and pictureſque. An extenſive park ſurrounds the manſion; and both nature and art have co-operated to render this place highly important and intereſting. The whole domain, within the plantations, is about fifteen miles in circumference. Longleat-houſe is built on a ſcale of magnificence proportionate to the extent and grandeur of the park in which it is ſeated. The architecture is the mixed ſtyle which prevailed at the end of the ſixteenth century; but it partakes far more of the Roman than of the pointed or Engliſh character. The form of the edifice is a parallelogram two hundred and twenty feet in length, by one hundred and eighty feet in depth; it is built entirely of free-ſtone, and is adorned with pilaſters of the Doric, Ionic, and Corinthian orders, with

enriched

enriched capitals, friezes, entablatures, parapets, and cornices. In the centre are two quadrangular courts; and externally it presents four principal fronts, each divided into three stories in height, and into different portions in width by square projections. The interior of this princely mansion corresponds with its exterior in character and effect; every thing is vast, and every part is grand. The principal apartments, with all the out-offices, have been recently formed and arranged by Jeffery Wyatt, esq., architect; who, well acquainted with the style of architecture in which the house was originally erected, has judiciously adhered to the same style in his additional works. Hence, when the whole is completed, it may be safely asserted, that for grandeur of effect, commodiousness of arrangement, and adaptation for a splendid establishment, it will equal any mansion in Great Britain. The libraries and other apartments are enriched with numerous pictures, among which are portraits of many personages of distinguished celebrity in the three last centuries.—Beauties of England and Wales, vol. xv., Wiltshire; by J. Britton, F.S.A. Hoare's "Ancient Wiltshire," fol. 1812. A fine view of this house, with a particular description of the seat, are published in Havell's Views of Seats, fol. 1817.

WARMINSTER, a post-town of Virginia, on James river; 90 miles W. of Richmond.—Also, a township of Pennsylvania, in the county of Bucks, containing 564 inhabitants.

WARMSDORF, a town of Germany, in the principality of Anhalt Cothen; 8 miles W. of Bernberg.

WARMSPRING MOUNTAINS, or *Jackson's Mountains*, mountains of Virginia. N. lat. 54° 30′. W. long. 79° 40′.

WARMSTADT, or WORMIT, a town of Prussia, in the province of Ermeland; 42 miles S.S.W. of Königsberg. N. lat. 54° 3′. E. long. 20° 7′.

WARMTH. See HEAT.

WARMTH, in *Painting*, denotes that fiery effect which a small addition of yellow gives to a true red; and that glowing appearance which red imparts to either yellow or blue. By warmth, in red, is to be understood a small inclination towards orange; by the same term, applied to yellow, a like tendency by the admixture of red; and by the same again, in the case of blue, must be understood its slightly verging on the purple. Coolness is opposed to warmth; but it is seldom used except in speaking of yellow and blue; and then it means either the negation of that which causes warmth, or a tendency to green, in either colour, by a slight admixture of the other. The sense of the term warmth, when applied to colouring, or the combined appearance of various teints, must not be confounded with that which it bears when we are speaking of particular colours. For then it relates to the procuring of a strong effect, by the disposition or contrast of the colours, or the grossness of the teints; and not the qualities peculiar to, or inherent in the colours themselves.

WARN, in *Law*, to summon a person to appear in a court of justice.

WARNA, in *Geography*, a town of Sweden, in East Gothland; 14 miles E.S.E. of Linkioping.

WARNAMMA, or WERINAMA, a town on the south coast of the island of Ceram. S. lat. 3° 45′. E. long. 129° 34′.

WARNAS, a name by which some of the chemical writers express what others of them call the *acetum philosophorum*, or vinegar of the philosophers.

WARNE, or WARNOW, in *Geography*, a river of Mecklenburg, which passes by Rostock, and runs into the Baltic, at Warnemunde.

WARNE, a river of England, in the county of Northumberland, which runs into the Irish sea, 4 miles S. of Holy island.

WARNEMUNDE, a town of the duchy of Mecklenburg, at the mouth of the Warne, where vessels bound to Rostock pay a toll, which formerly amounted to 80,000 rix-dollars a year; at present to not more than 6000; 9 miles N. of Rostock.

WARNENAS, a town of Sweden, in the province of Smaland; 11 miles S.S.W. of Calmar.

WARNER, a town of New Hampshire, in the county of Hillsborough, containing 1838 inhabitants; 20 miles W. of Concord.

WARNER's *Patent*, a town of New Hampshire, in the county of Cooz, containing 35 inhabitants.

WARNERIA, in *Botany*, was so called by Miller, in honour of Richard Warner, esq. of Woodford-row, Essex, author of the *Plantæ Woodfordienses*, published in 1771. This gentleman, rather a patron of the science than a deep botanist, is mentioned by Dr. Pulteney, as a successful cultivator of exotic plants, and a lover of indigenous botany. On his death, April 11, 1775, he left his valuable library to Wadham college, Oxford, where he received his education; this bequest was accompanied by a stipend for a botanical lecture, of which we have never heard the result. He is also celebrated for his critical knowledge of Shakspeare, of whose plays he had long meditated an edition; but resigned his pretensions to Mr. Steevens. The genus dedicated to Mr. Warner, has not however been allowed to retain his name. It is the HYDRASTIS of Linnæus; see that article.

A small pamphlet of twelve pages, entitled "Additions to Warner's Plantæ Woodfordienses," was printed in 1784, by Thomas Farleigh Forster, esq. F.L.S. a distinguished British botanist.

WARNESS, in *Geography*, a cape on the south coast of the island of Eday. N. lat. 59°. W. long. 2° 42′.

WARNETON, a town of France, in the department of the Lys. This town was ceded to the Dutch in 1715, as a barrier town, and before the revolution, with its territories, belonged to the prince of Orange; 2 posts N.W. of Lille.

WARNING-*Piece*, in the *Military Art*. See *Evening* GUN.

WARNING-*Wheel*, in a clock, is the third or fourth, according to its distance from the first wheel. See CLOCK.

WARNITZ, in *Geography*, a town of European Turkey, in Bessarabia, remarkable for being the place where, in the year 1709, Charles XII. of Sweden broke up his camp, and continued till the year 1713, when the Turks were obliged to make use of force to get rid of him: near Bender.

WARNOTH, in our *Old Writers*, an ancient custom, by which if a tenant, holding of the castle of Dover, failed in paying his rent at the day, he was to forfeit double; and for the second failure, treble; and the lands so held were called *terris cultis*, and *terris de warnoth*.

WARO, in *Geography*, a town of Sweden, in the province of Halland; 13 miles S. of Königsberg.

WAROLA, a town of Sweden, in West Gothland; 66 miles E. of Uddevalla.

WARP, in *Agriculture*, a slimy sort of substance or material which is deposited or let fall upon land by the sea-tides in some particular situations, and by which a new, rich, and fertile sort of alluvial soil is formed. The term is also sometimes applied to the ooze or slimy matter thrown up by the sea in ordinary cases. It is in both instances a very

very productive material when employed as manure in composition with other matters, or used alone.

Warps are applied to flat, wide beds or ridges of ploughed land in some districts. It is often a bad mode of laying land when in the state of tillage.

Warp *in Cows*, in *Rural Economy*, a term made use of in some places to signify to miscarry or slip their calves. Where cows are liable to warp or slip their calves, and it has taken place in different cases, it is considered dangerous to permit them to continue in the yards with the whole of the same sort of stock, from the fear of the same effect being produced on the others. For though some cows may probably, by constitutional weakness, or some bodily imperfection, be more liable to warp than others; such accidental circumstances as produce sudden fright are very often the cause. Putrid disagreeable smells, and the exposure of putrid animal substances, have frequently too the same effect. It is stated, that in an inclosure in the parish of Arlingham, in the county of Gloucester, near to which was a dog-kennel, eight heifers out of twenty warped, in consequence, as it was supposed by the farmer, of the frequent exposure of the flesh, and the skinning of the dead horses before them: the remainder being removed to a distant pasture, it is said, did well. Many other cases of this sort have likewise been noticed.

Warp, in the *Manufactures*, is the threads, whether of silk, wool, linen, hemp, cotton, or the like, that are extended lengthwise on the weaver's loom, and across which the workman, by means of his shuttle, passes the threads of the woof, to form a cloth, ribband, fustian, or other matter.

For a woollen stuff, &c. to have the necessary qualities, it is required, that the thread of the warp be of the same kind of wool, and of the same fineness throughout; that they be sized with Flanders or parchment-size, well prepared; and that they be in sufficient number, with regard to the breadth of the stuff to be wrought. See Woof, Cloth, &c.

Warp, in a *Ship*, is a small rope employed occasionally to remove a ship from one place to another, in a port, road, or river. Hence,

To Warp, in *Sea Language*, is to change the situation of a ship, by pulling her from one part of a harbour, &c. to some other, by means of warps, which are attached to buoys, to anchors sunk in the bottom, or to certain stations upon the shore, as posts, rings, trees, &c. The ship is accordingly drawn forwards to those stations, either by pulling on the warps by hand, or by the application of some purchase, as a tackle, windlass, or capstern, upon her deck. When this operation is performed by the ship's lesser anchors, these machines, together with their warps, are carried out in the boats alternately towards the place where the ship is endeavouring to arrive; so that when she is drawn up close to one anchor, the other is carried out to a competent distance before her, and being sunk, serves to fix the other warp, by which she is farther advanced.

Warping is generally used when the sails are unbent, or when they cannot be successfully employed, which may arise from the unfavourable state of the wind, the opposition of the tide, or the narrow limits of the channel. Falconer.

Warp also denotes a towing-line, by which boats are hauled in a canal, &c.

Warp *of Shrouds*, the first given length, taken from the bolster at the mast-head to the foremost dead-eye.

WARPED *into Junks*, in *Rope-Making*, is yarn warped into short lengths for spun-yarn.

WARPEN, in *Geography*, a lake of Sweden, in Dalecarlia.

WARPENI. See Wardpenny.

WARPING *of Land*, in *Agriculture*, the practice of forming, fertilizing, and improving lands of the tillage kind, which is employed in some particular situations on the borders of large rivers and channels into which the sea-tides flow, and where the level of the ground is such as to admit of their being overflowed with much facility. This practice has hitherto been chiefly confined to the extensive sea-districts of Lincolnshire and Yorkshire, but is little known to most others. It has been remarked by the writer of a late calendar of husbandry, that the waters of the tides that come up the Trent, Ouse, Dun, and other rivers of the former of the above counties, which empty themselves into the great estuary of the Humber, are muddy to an excess; insomuch that in the summer season, if a cylindrical glass, twelve or fifteen inches long, be filled with the water, it will presently deposit an inch, and sometimes more, of this muddy matter, or what is there called warp. Where it comes from is, it is said, a disputed point: the Humber, at its mouth, is clear water; and no floods in the countries washed by the warp rivers bring it, but, on the contrary, do much mischief by spoiling the warp. In the very driest seasons and longest droughts, it is found the best and most plentiful.

The improvement in land, which is made by this means, is, it is said, perfectly simple and easy, consisting in nothing more than merely letting in the tide at high water to deposit the warp, or muddy material, and permitting it to run off again as the water falls. But in order to render it fully efficacious, the water must be at command, so that it may be kept out and let in at pleasure, consequently there must be not only a cut or canal made to join the river, but a sluice at the mouth of it formed so as to open or shut, as wanted; and that the water may be of a proper depth on the land to be warped, and also prevented flowing over contiguous lands, whether cultivated or not, banks are necessary to be raised around the fields to be warped, of from three or four to six or seven feet high, according as the circumstances of the cases may be. Thus, if the tract be large, the canal which takes the water, and which, as in the practice of irrigation, might, it is said, be called the grand *carrier*, may be made several miles long: it has been tried, it is said, as far as four, so as to warp the lands on each side the whole way, and lateral cuts made in any suitable direction for the same purpose; it is, however, to be observed, that the effect lessens as the river is receded from; that is, it demands longer time for the water to deposit warp enough for producing the benefit.

It is to be noticed in this case, however, it is said, that the effect is very different from that of irrigation or watering; as it is not the water that works the effect or improvement, but the mud or material which is deposited, so that in time of floods the business ceases, as also in winter; and that it is not in this case to manure the soil, but to create and form it. What the land is, it is supposed, which is intended to be warped, is not of the smallest consequence: a bog, clay, sand, peat, or even a barn floor, all one and the same; as the warp raises it in one summer from six to sixteen inches thick, and in the hollows or low places, two, three, or four feet, so as to leave the whole piece or field level. Thus, a soil of any depth that may be required is formed, which consists of mud, or a material of that sort, of vast fertility, though not containing much besides sand; but a sand unique, it is supposed.

It is stated in addition, too, by the same writer, that Mr. Dalton, of Knaith, on Trent, in the same county, sent some of

of this material to an eminent chemist, whose report of it was, that it contained mucilage, and a very minute portion of saline matter; a considerable one of calcareous earth: the residue is mica and sand; the latter in far the largest quantity, both in very fine particles. Here, it is said, there is no mention of any thing argillaceous; but from examining in the fields much warped, the writer is clear that there must be clay in some, from its caking in small clods, as well as from its cleansing cloth of grease, almost like fuller's earth. He was told too, by a considerable warp farmer, that the stiffest warp was the best; but in general it has the appearance, it is said, of sand, and all of it glitters with the micaceous particles.

It is evident therefore that the soil or bed which is formed in the cases of warping is somewhat of the alluvial kind, and of course well constituted for the growth of most sorts of tillage crops.

Warping is a practice which begins in the month of July, and which proceeds during the summer season; and as it can only be performed at that particular period, every occasion of having it executed should constantly be embraced, by having the works in perfect repair and readiness, that every tide may be made to produce its full effect. In regard to the utility and advantage of doing this sort of work in the summer months, it may be noticed, that at these times the lands not only become the soonest dry, a circumstance which must always fully take place before the process of cultivation can be carried on, but the tides are less mixed with fresh water, in which situation they are constantly found the most effectual in the business.

In respect to the method of performing the work, it is described by lord Hawke, in one of the Reports on the Agriculture of Yorkshire, in the manner which is given below.

The land to be warped must, it is said, be banked round against the river; the banks for which are made of the earth taken on the spot from the land: they must be formed so as to slope six feet; that is, three feet on each side of the top or crown of the bank, for every foot perpendicular of rise: their top or crown part being made broader or narrower, according to the impetuosity of the tide, and the weight and quantity of water; and they extend from two feet to twelve: their height is regulated by the height to which the spring-tides flow, so as to exclude or let them in at pleasure. In these banks, there are to be more or fewer openings formed, according to the size of the field or ground to be warped, and the choice of the occupier or proprietor; but in general they have only two sluices, it is said; one called the flood-gate, to admit, the other termed the clough, to let off the water in a gentle manner; these are sufficient, it is observed, for ten or fifteen acres: when the spring-tide begins to ebb, the flood-gate is opened to admit the tide, the clough having been previously shut by the weight of the water brought up the river by the flow of the tide. As the tide ebbs down the river, the weight or pressure of the water being taken from the outside of the clough next the river, the tide-water that has been previously admitted by the flood-gate opens the clough again, and discharges itself slowly but completely through it. In forming the cloughs, they are walled on each side, and so constructed, as to let the water run off between the ebb of the tide admitted, and the flow of the next; and to this point particular attention is, it is said, paid by the workmen. The flood-gates are placed so high in these intentions as only to let in the spring-tides when opened. They are, of course, placed above the level of the common tides.

Willows are also, it is said, occasionally planted on the fronts of the banks, to break the force of the tides, and defend the banks, by raising the fronts of them with warp thus collected, accumulated, and detained: but these willows must never, it is remarked, be planted on the banks themselves, as they would in that way destroy them, by giving the winds power to shake and disturb them.

In regard to the expence, it is stated that the first cost of a sluice for warping, which is five feet in height, and seven feet in width, may be estimated at from four to five hundred pounds. And that such a sluice will in general be adequate to the warping of fifty acres annually; and where the soil or land is contiguous to the river, for seventy or more.

In these cases, the nature of the culture which is proper, the crops, and various other circumstances that require attention, are well shewn and pointed out in the observations that are given below, which were taken by the first of the above writers on the farm of Mr. Webster, at Bankside, in the county of Lincoln, who has made so great an improvement by warping, that it merits, it is said, particular notice and regard. His farm of two hundred and twelve acres, it is said, is all warped; and that to shew the immense importance of the improvement, it would be necessary only to mention that he gave eleven pounds an acre for the land, and would not now take seventy pounds an acre for it; he considers it worth eighty pounds, and some of it even one hundred pounds the acre: not that it would sell so high at present however; yet the whole expence of his sluices, cuts, banks, and other things, did not, it is said, exceed two thousand five hundred pounds, or twelve pounds the acre; from which, however, to continue the account, one thousand five hundred pounds may, it is said, be deducted, as a neighbour below him offers five pounds an acre for the use of his sluice and main cut, to warp three hundred acres by, which will, it is said, reduce Mr. Webster's expence to one thousand pounds, or about five pounds an acre. Take it, however, it is said, at the highest, twelve pounds, and add eleven pounds, the purchase, together twenty-three pounds an acre; if he can sell at seventy pounds, it is forty-seven the acre profit. This, it is thought, is prodigious, and sufficient to prove that warping exceeds all other improvements. Mr. Webster has, it is observed, warped to various depths, to eighteen inches, two feet, two and a half feet, &c. He has some, it is said, that, before warping, was moorland, worth only one shilling and sixpence the acre, now as good as the best. Some of it would let at five pounds the acre for flax or potatoes; and the whole at fifty shillings. He has twenty acres that he warped three feet deep, between the beginning of June and the end of September, and eighteen acres, part of which is three feet and a half deep. He has applied it, too, on stubbles in autumn by way of manuring, it is said; for it should be noted, the writer says, as a vast advantage in this species of improvement, that it is renewable at any time: were it possible to wear out by cropping or ill-management, a few tides will, it is asserted, at any time restore it. As to the crops he has had, they have, it is said, been very great indeed; of potatoes from eighty to one hundred and thirty tubs of thirty-six gallons each, selling the round sorts at from three shillings, to three shillings and sixpence a tub; and kidneys at from five shillings to eight shillings the tub. Twenty acres warped in 1794, could not, it is said, be ploughed for oats in 1795; he, therefore, sowed the oats on the fresh warp, and scuffled in the seed by men drawing a scuffler, eight to draw, and one to hold: the whole crop was very great; but on three acres of it, measured separately, they amounted, it is said, to fourteen quarters one sack the

acre.

acre. The writer here obſerves, that he little thought of finding exactly the huſbandry of the Nile in England. He had, however, before heard of clover-ſeed being ſown in this manner on freſh warp, and ſucceeding greatly.

It is ſtated in addition, that Mr. Webſter warped twelve acres of wheat-ſtubble, and ſowed oats in April, which produced twelve quarters an acre; then wheat, thirty-ſix buſhels an acre: that his wheat is never leſs than thirty buſhels; and that ſix acres of beans produced thirty loads the acre, or ninety buſhels; that one acre, meaſured to decide a wager, yielded ninety-nine buſhels; that he has had one hundred and forty-four pods from one bean, on four ſtalks; and Tartarian oats ſeven feet high; that one piece, warped in 1793, produced oats in 1794, ſix quarters an acre. White clover and hay-ſeeds were ſown with them, and mown twice the firſt year: the firſt cutting yielded three tons of hay on the acre; the ſecond, one ton; and after that, an immenſe eddiſh. Warp, it is obſerved by Mr. Webſter, brings weeds never ſeen there before, particularly muſtard, creſſes, and wild celery, with plenty of docks and thiſtles; alſo flax, from forty to fifty ſtones the acre.

It is remarked too, in the ſame agricultural work, that Mr. Nicolſon, at Rawcliffe, when this practice is intended, takes the levels firſt, then builds a ſluice; that if a quarter of a mile or half a mile in length, ſixty acres may be done the firſt year; the drier the ſeaſon the better, as ſuggeſted above. The clough or ſluice, when eight feet wide, and five or ſix feet high, will be 400*l.*; and a drain made fourteen feet at the bottom, and as much more at top, from thirty to forty ſhillings an acre of twenty-eight yards; banks made from four to eight feet high, and the expence from ſeven to twenty ſhillings the acre of twenty-eight yards: that he begins the buſineſs at from Lady-day till Martinmas, but all depends on ſeaſon; the depth will depend on and be regulated by circumſtances. If a landlord warp, it ſhould be deep, it is ſaid, at once; if a tenant, ſhallow and repeated; for as good corn will grow at ſix inches as ſix feet; at three inches, great crops; the ſtiffer the warp the better, as already noticed. Some ſeaſons, corn is ſown the year after. Warp is cold, and, if deep, takes time; a dry year beſt; great ſeed crops. The crops ought to be beans, twenty loads; oats, ten quarters; wheat, ten or twelve loads: never barley! After ſix years, potatoes, and good flax: he makes it worth from forty to fifty pounds an acre, it is ſaid. And Mr. Wilſon's idea of warping is conſidered by the writer as very juſt; which is to exhauſt the low lands in favour of the hills; then to warp ſix inches deep, to exhauſt that to make the hills; then to warp again: and by thus doing, to keep the warp-land in the higheſt order, and at the ſame time to work a great improvement to all the higher grounds.

The ſubſtance of the obſervations of a commiſſioner much employed in warping is, that warp leaves one-eighth of an inch every tide on an average; and that theſe layers do not mix in an uniform maſs, but remain in leaves or layers diſtinct. That if there be only one ſluice, then only every other tide can be uſed; as the water muſt run perfectly off, in order that the ſurface may incruſt; and that if the canal be not empty, the tide has not the effect. At Althorp, Mr. Bower has warped, it is obſerved, to the depth of eighteen inches in a ſummer.

Ten quarters of oats an acre is common, on raking in the ſeed on warp; the more ſalt there is in the warp, the better; but one fallow, in that caſe, is, it is ſaid, neceſſary to leſſen the effect, or it hurts vegetation.

It is remarked, that as a ſort of new ſoil is created by this mode of practice, it is of but little conſequence what the original nature or quality of the land may be, almoſt all kinds being improved by it, as ſeen already; but that, at the ſame time, it may be the moſt beneficial in ſuch light ſoiled lands as are very open and porous, and ſuch ſtiff ones as are defective in calcareous matter, and which require ſubſtances of this kind to render them leſs tenacious: and that land, when once well warped, will continue for a vaſt length of time in a good ſtate of fertility. But ſtill it is ſuggeſted, by ſome experienced warpers, as a better practice, in this mode of tillage improvement, to apply a ſmall portion of warp whenever the land is in the ſtate of fallow, which will be about every five or ſix years; as, by this means, the farmer will be more ſecure of having good crops. The depth to which the lands are covered by the tides muſt, it is ſaid, be regulated according to their levels, and the height to which the tides riſe in the rivers from which they proceed.

It is ſtated in the Agricultural Report of the Weſt Riding of the County of York, that where it can be done, the water may be admitted to the height of three, four, or more feet; and that the depoſit of the muddy ſediment or material is in ſome meaſure proportionate to the height of the tide-water; but that the ſame effects may be gained from much ſmaller quantities of water, by continuing the proceſs or practice a great number of tides: alſo, that ſuch lands as have been ſubjected to this method of improvement, ſhould conſtantly be kept in the ſtate of tillage for ſome length of time afterwards, in order that they may be brought to a proper condition for the production of graſs.

In reſpect to the expence of this mode of improving lands, it muſt neceſſarily differ much, it is ſaid, in different caſes, according as the circumſtances of ſituation, diſtance, &c. may vary; but it can ſeldom exceed twelve or fifteen pounds the acre, according to ſome, as the firſt of the above writers; and in moſt inſtances it muſt, it is thought, be greatly below ſuch eſtimates. It is, however, properly remarked by Mr. Day, another experienced writer on the ſubject, that no eſtimate can be made, without viewing the ſituation of the lands to be warped, and the courſe and diſtance it will be neceſſary to carry the warp to ſuch lands: as, 1ſt, the ſituation of the lands muſt be fully conſidered; 2dly, the quantity of land the ſame drains and cloughs will be ſufficient to warp; and 3dly, the expence of building the cloughs, cutting the drains, embanking the lands, &c. An eſtimate of which expence being made, then it will be neceſſary to know the number of acres ſuch cloughs and drains will warp, before any eſtimate *per* acre can be made; conſequently it will be eaſy to conceive, that the greater quantity of land the ſame cloughs and drains will warp, the eaſier the expence will be *per* acre. It is his opinion, that there are great quantities of land in the above county, and others, which might be warped at ſo ſmall an expence as from four to eight pounds the acre, which is nothing, it is thought, in compariſon to the advantages which would ariſe from it.

The writer has known land which has been raiſed in value by warping, from five to upwards of forty and even fifty pounds the acre; therefore it is eaſy to conceive, it is ſaid, that the greateſt advantages ariſe upon the worſt land, and the more open and porous the ſoil the better, as has been noticed, as the wet filters through readily, and it ſoon becomes fit for uſe. The advantages of warping are, it is thought, very great; as, after lands have been properly warped, they are ſo enriched thereby, that they will bring very large crops for ſeveral years afterwards, without any manure; and, when it is neceſſary, the lands may be warped again, by opening the old drains, which may be done at a very trifling expence, and will bring crops in ſucceſſion for many

many years, with very little or no tillage at all, if the lands be kept free from quick grafs, and other weeds, which muft be the cafe in all lands where they are properly managed; befides, the drains which are made for the purpofe of warping, are the beft drains, it is faid, that can be conftructed for draining the lands at the time they are not ufed for warping, which is another very great advantage, it is thought, in low lands in this fort of bufinefs.

As to the difadvantages in warping, it is conceived there can be very few, if any, as the land may be warped in the year in which it fhould be a fummer fallow. Indeed all lands that are warped, it is faid, fhould be prepared in the fpring as fallow lands, fo that they may be ready to let in the warp by the month of June, as the three fucceeding months are the moft proper ones in the whole year for warping; but they might be continued in warping longer when neceffary, therefore the rent is, it is thought, out of the queftion. The only inconveniences that can arife are, in the writer's opinion, from the blowing up of the cloughs, or the breaking of the banks, which is feldom the cafe, except where there is fome neglect in the works, and thereby overflowing the adjoining lands, and very probably deftroying the crops; it, however, very much enriches the land that is overflown: fuch accidents and circumftances fhould notwithftanding be guarded againft by every cautious contriver of fuch works.

It is noticed that warped land feldom fails of carrying good crops of moft forts; but that oats are moft to be depended on the firft feafon. It is thought that warped land is better calculated for the growth of oats, wheat, and beans, than barley, as the foil by that means becomes fo very rich, that barley in general grows too coarfe. It never fails growing artificial feeds of all kinds, and is the beft of all land for pafture.

When once well warped, land lafts a confiderable length of time, and is generally the moft conveniently and beft done in a gradual manner, as fuggefted above, as by fuch means the farmer will feldom fail of having great crops. In fhort no fort of field management is known that is fo cheap as warping, when properly applied. Land of all qualities is warped; but in general it is not warped more than one year in feven; one year's warping will do for that length of time in moft cafes. The land is various as to the preference of the grain or crops to be fown upon it, as in other cafes.

In fome cafes, land has been raifed confiderably by warping; in one inftance of bad corn land, almoft good for nothing, it was raifed in three years fourteen inches: it lay idle for that time, that it might be raifed by this means; it was then fown with beans, and promifed a crop of eight quarters.

The warp confifts of mud and falts depofited by the ebbing-tide, as fuppofed above: near Howden, one tide will, it is faid, depofit an inch of mud, and this depofit is more or lefs in proportion to the diftance from the Humber, at which the place is.

Cherry-cob fands were gained, it is afferted, by warping from the Humber; and they are fuppofed to be at leaft four yards thick of warp: fome of thefe were ploughed for twelve, fourteen, or fixteen years, it is faid, before they would grow grafs-feeds: the greater part is now in feeding land, and makes very fine pafture.

The land muft always be in tillage for fome confiderable time after warping, as pointed out above; and if laid down for grafs, and continued in that ftate, it is not warped; for the falts in the mud would, it is faid, infallibly kill the grafs-feeds.

When it is propofed to fow the land again with corn, then it is warped: when the farmers find the grafs decline, they then warp and plough it out: as the land varies in quality, fo does the time during which it will produce good grafs. It is never in the ftate of fallow, but in the year when it is warped, as fuggefted already.

In regard to the practice of warping in the low part of the Weft Riding of the above diftrict, it is conceived, that it originated from the tides overflowing the banks of the rivers, and thereby leaving a fediment, which was found to be excellent manure, and that the land brought very large crops after being covered or flooded in that manner. Indeed, it is believed that the firft trial of warping was made by a fmall farmer, who had fome low land adjoining a certain river called the Dutch river, which was a very poor foil, the loweft part of which was levelled with the higheft, by the overflowing of fome very high tides, which convinced the farmer that he could, by banking the land round, and laying a tunnel through the bank of the river, raife the fame, and make it of confiderably more value. He confequently applied to the commiffioners of fewers for the level of Hatfield chafe, as being appointed for draining that part of the diftrict, &c. to grant him an order, giving him leave to lay a tunnel, a few inches fquare, through the bank of the faid river, for the purpofe of warping his land, which was granted him with a great deal of reluctance, for fear of overflowing the country thereabouts with water, on his giving a proper fecurity for indemnifying the county againft any injury which might happen thereby, which anfwered his purpofe, it is faid, very well. But now, it is obferved, there are cloughs laid of fix or eight feet wide, and drains made of proper dimenfions, to carry the water as circumftances may be. The writer is not certain how long it is fince warping came much into practice, but it is not, however, many years; it is believed not more then (1799) than twenty or twenty-five years, or thereabouts.

It is ftated, however, that Mr. Richard Jennings, of Armin, near Howden, was the firft perfon who tried the experiment of warping, about fifty years fince at the above period. It was next attempted, then about forty years ago, by a Mr. Farham, fteward to —— Twifleton, efquire, of Rawcliffe, as well as by a Mr. Mould, of Potter Grange; and it has been tried, it is faid, by a great variety of perfons fince that time, to their great advantage.

It is obferved in the work firft noticed, that a very great object in the hufbandry of warping, is the application and extenfion of it in other diftricts. They have much warp, it is faid, on all the coaft from Wifbeach to Bofton, and other places in that vicinity, and which through a long fucceffion of ages has formed a large tract of warp country, called there the *Silt* diftrict, yet no attempts that have been heard of have been made there to warp artificially. It is therefore fuggefted to the proprietors and farmers living near a muddy river, that they fhould confider the pofition of their grounds well, and try the amount of the fubfidence of the mud in the water, in a cylindrical glafs jar, as a treafure may be near them without their knowing any thing of it. See the Corrected Agricultural Reports of Lincolnfhire and the Weft Riding of Yorkfhire.

WARPING-*Banks*, the mounds of earth that are raifed up round the fields or grounds to be warped againft the rivers. See WARPING *of Land*.

WARPING *Cuts*, *Drains*, or *Gutters*, the open paffages which are formed for taking away the water in *warping of land*. See the article.

WARPING *Clough*, *Hatch*, or *Sluice*, the ftrongly framed wood-work which is placed in the inlet cut in the bank of the warping river, which cut is walled on each fide with a

ftrong

ftrong wall, and this frame or gate for the flood-tide firmly fixed in the middle part, in order to let in and out the water. They are fometimes conftructed nearly on the fame principle as thofe which are ufed at water-mills, and commonly like the gates and fluices in canals for raifing the water to affift the paffage of boats on them; in fome cafes, too, fuch gates are placed above the clough in a perpendicular manner. The fizes and dimenfions of them are different according to the differences in the circumftances of the cafes, as well as the coft of them. Some notion of each of which has been given in fpeaking of the practice of warping. See Warping *of Land*.

Warping, in *Rope-Making*, is running the yarn off the winches into hauls to be tarred.

Warping-*Hook*, for hanging the yarn on when warping into hauls for tarring, is a large iron hook hung occafionally to the warping-pofts.

Warping-*Poft*, a poft fourteen or fixteen inches diameter, fixed in the middle of a rope-ground, for warping the yarns into hauls.

WARRAN, in *Geography*. See Oran.

WARRANAROU, a fmall ifland near the eaft coaft of the ifland of St. Vincent. N. lat. 13° 22′. W. long. 61° 11′.

WARRANT, an act, inftrument, or obligation, by which a perfon authorizes another to do fomething, which he had not otherwife a right to do.

Warrant, in *Law*, is a precept under the hand and feal of fome officer, to bring any offender before the perfon granting it.

A warrant may be granted in extraordinary cafes by the privy-council, or fecretaries of ftate; but ordinarily by juftices of the peace. This they may do in any cafes where they have a jurifdiction over the offence, in order to compel the perfon accufed to appear before them. And this undoubtedly extends to all treafons, felonies, and breaches of the peace; and alfo to all fuch offences as they have power to punifh by ftatute.

Sir Edward Coke lays it down, that a juftice of the peace cannot iffue a warrant to apprehend a felon upon mere fufpicion, nor even till an indictment be actually found; but this opinion has been combated by fir Matthew Hale, who maintains that a juftice of peace hath power to iffue a warrant to apprehend a perfon accufed of felony, though not yet indicted; and that he may alfo iffue a warrant to apprehend a perfon fufpected of felony, though the original fufpicion be not in himfelf, but in the party that prays his warrant. But in both cafes it is proper to examine upon oath the party requiring a warrant, as well to afcertain that there is a felony or other crime actually committed, without which no warrant fhould be granted; as alfo to prove the caufe and probability of fufpecting the party, againft whom the warrant is prayed. This warrant ought to be under the hand and feal of the juftice; fhould fet forth the time and place of making, and the caufe for which it is made; and fhould be directed to the conftable, or other peace officer, or it may be to any private perfon by name, requiring him to bring the party either generally before any juftice of the peace for the county, or only before the juftice who granted it: the warrant in the latter cafe being called a *fpecial* warrant.

A *general* warrant to apprehend all perfons fufpected, without naming particularly, or defcribing any perfon in fpecial, is illegal and void for its uncertainty; for it is the duty of the magiftrate, and ought not to be left to the officer, to judge of the ground of fufpicion; and a warrant to apprehend all perfons guilty of a crime therein fpecified, is no legal warrant; becaufe the point, upon which its authority refts, is a fact to be decided upon in a fubfequent trial; namely, whether the perfon apprehended upon it be really guilty or not. It is, therefore, in fact, no warrant at all; for it will not juftify the officer who acts under it; whereas a warrant, properly penned (even though the magiftrate who iffues it fhould exceed his jurifdiction) will, by ftatute 24 Geo. II. cap. 44. at all events indemnify the officer, who executes the fame minifterially. A practice, indeed, had obtained in the fecretaries' office, ever fince the Reftoration, grounded on fome claufes in the acts for regulating the prefs, of iffuing general warrants to take up (without naming any perfon in particular) the authors, printers, and publifhers, of fuch obfcene or feditious libels as were particularly fpecified in the warrant. When thofe acts expired in 1694, the fame practice was inadvertently continued in every reign, and under every adminiftration, except the four laft years of queen Anne, down to the year 1763; when fuch a warrant being iffued, its validity was difputed; and the warrant was adjudged, by the whole court of king's bench, to be void. After which, the iffuing of fuch general warrants was declared illegal by a vote of the houfe of commons. Com. Journ. 22 April, 1766.

When a warrant is received by the officer, he is bound to execute it, fo far as the jurifdiction of the magiftrate and of himfelf extends. A warrant from the chief or other juftice of the court of king's bench, extends all over the kingdom; and is tefted or dated England, and not any particular county. But the warrant of a juftice of peace in one county muft be backed, that is, figned by a juftice of the peace in another, before it can be executed there. Formerly, regularly fpeaking, there ought to have been a frefh warrant in every frefh county; but the practice of backing warrants had long prevailed without law, and was at laft authorized by ftatutes 23 Geo. II. cap. 26. and 24 Geo. II. cap. 55. And now, by ftatute 13 Geo. III. cap. 31. any warrant for apprehending an Englifh offender, who may have efcaped into Scotland, and *vice verfa*, may be indorfed and executed by the local magiftrates, and the offender be conveyed back to that part of the united kingdoms in which fuch offence was committed. Blackft. Comm. book iv.

Warrant *of Attorney*, is that by which a man appoints another to do fomething in his name, and warrants his action.

It feems to differ from a *letter of attorney*, which paffes under hand and feal of him that makes it, before credible witneffes; whereas *warrant of attorney*, in perfonal, mixed, and fome real actions, is put in courfe by the attorneys for the plaintiffs or defendants. Though a warrant of attorney, to fuffer a common recovery by the tenant, or vouchee, is to be acknowledged before fuch perfons as the commiffion for the doing of it directs.

It is ufual, in order to ftrengthen a bond creditor's fecurity, for the debtor to execute a warrant of attorney to any one, empowering him to confefs a judgment by *nihil dicit*, *cognovit actionem*, or *non fum informatus*, in an action of debt to be brought by the creditor for the fpecific fum due; which judgment, when confeffed, is abfolutely complete and binding.

In the court of common pleas, there is a *clerk of the warrants*, who enters all warrants of attorney for plaintiff and defendant.

Warrant, *Search*. See Search.

Warrant *Officers*. See Officers.

Warrant, in the *Manege*. A jockey that fells a horfe is, by cuftom, in fome countries, obliged to warrant him, that is, to refund the money that was given for him, and re-deliver the horfe in nine days after the firft delivery, in cafe

cafe he fold him when under fuch infirmities as may efcape the view of the buyer, and as are not obvioufly difcovered. Thefe infirmities are purfivenefs, the glanders, and unfoundnefs, hot and cold: but he does not warrant him clear of fuch infirmities as may be difcerned. Not only jockeys or horfe-merchants, but alfo perfons of what quality or condition foever, are obliged to take back the horfe, and repay the money, if he is affected with the faid diforders. But the rule of the law of England is, *caveat emptor*, unlefs the feller exprefsly warrants. See WARRANTY.

WARRANTS, *Dividend*. See DIVIDEND.

WARRANTS *for impreffing Chorifters*. See TUSSER.

WARRANTIA CHARTÆ, a writ that lies for a perfon who is infeoffed in lands and tenements, with claufe of warranty; and is impleaded in an affize, or writ of entry, in which he cannot vouch, or call to warranty. See VOUCHER.

WARRANTIA *Diei*, a writ which lies in a cafe where a man, having a day affigned perfonally to appear in court to an action in which he is fued, is, in the mean time, by commandment, employed in the king's fervice; fo that he cannot come at the day affigned. It is directed to the juftices, ordering them not to find or record him in default.

WARRANTIZANDUM. See SUMMONS *ad Warrantizandum*.

WARRANTO. See QUO *Warranto*.

WARRANTY, WARRANTIA, in *Law*, a promife or covenant, by deed, made by the bargainer for himfelf and his heirs, to warrant and fecure the bargainee, and his heirs, againft all men, for enjoying the thing agreed on or granted between them.

Such warranty paffes from the feller to the buyer; from the feoffer to the feoffee; from him that releafes to him that is releafed from an action real. The form of it is thus: "Et ego vero præfatus A. et hæredes mei, prædictas quinque acras terræ cum pertinentiis fuis præfato B. hæredibus et affignatis fuis, contra omnes gentes warrantizabimus in perpetuum, per præfentes."

Note, under *hæredes*, heirs, are comprifed all fuch as the firft warranter's lands come to, whether by defcent, purchafe, or the like.

Warranty is either *real*, or *perfonal*. *Real*, when it is annexed to lands and tenements granted in fee, or for life, &c. which, again, is either *in deed*, or *in law*.

Perfonal either refpects the property of the thing fold, or the quality of it.

By the civil law, an implied warranty was annexed to every fale, in refpect to the title of the vendor: and fo too, in our law, a purchafer of goods and chattels may have a fatisfaction from the feller, if he fells them as his own, and the title proves deficient, without any exprefs warranty for that purpofe. But, with regard to the goodnefs of the wares fo purchafed, the vender is not bound to anfwer; unlefs he exprefsly warrants them to be found and good, or unlefs he knew them to be otherwife, and hath ufed any art to difguife them, or unlefs they turn out to be different from what he reprefented to the buyer. And if he, who felleth any thing, doth upon the fale warrant it to be good, the law annexes a tacit contract to this warranty, that if it be not fo, he fhall make compenfation to the buyer; alfo, it is an injury in good faith, for which an action on the cafe will lie to recover damages. The warranty muft be upon the fale; for if it be made after, and not at the time of the fale, it is a void warranty. Alfo the warranty can only reach to things in being at the time of the warranty made, and not to things *in futuro*: as, that a horfe is found at the time of buying him, not that he will be found two years hence. Any artifice to difguife goods fhall be equivalent to an exprefs warranty, and the vendor is anfwerable for their goodnefs.

A general warranty will not extend to guard againft defects that are plainly and obvioufly the object of one's fenfes, as if a horfe be warranted perfect, and wants either a tail or an ear, unlefs the buyer in this cafe be blind. Alfo, if a horfe is warranted found, and he wants the fight of an eye, though this feems to be the object of one's fenfes, yet as the difcernment of fuch defects is frequently matter of fkill, it hath been held that an action on the cafe lieth, to recover damages for this impofition. Blackft. Com. book iii.

Real warranty, again, in refpect of the eftate, is either *lineal*, *collateral*, or *commencing by diffeifin*.

Lineal warranty was where the heir derived, or might by poffibility have derived, his title to the land warranted, either from or through the anceftor who made the warranty; as, where a father, or an elder fon in the life of the father, releafed to the diffeifor of either themfelves or the grandfather, with warranty, this was *lineal* to the younger fon.

Collateral warranty was where the heir's title to the land neither was, nor could have been, derived from the warranting anceftor; as, where a younger brother releafed to his father's diffeifor, with warranty, this was collateral to the elder brother.

But where the very conveyance, to which the warranty was annexed, immediately followed a diffeifin, or operated itfelf as fuch, (as, where a father tenant for years, with remainder to his fon in fee, aliened in fee-fimple with warranty,) this, being in its original manifeftly founded on the tort or wrong of the warrantor himfelf, was called a warranty *commencing by diffeifin*; and being too palpably injurious to be fupported, was not binding upon any heir of fuch tortious warrantor. Blackft. Com. book ii.

WARRAWARROW, in *Geography*, a bay of the ifland of St. Vincent; 1 mile S. of Kingfton bay.

WARRELL, a river of Hindooftan, one of the arms of the Indus.

WARREN, WARENNA, a franchife, or place privileged, either by prefcription, or grant from the king, to keep beafts and fowl of warren in; as rabbits, hares, partridges, pheafants, &c.

A man that has the franchife of warren is in reality no more than a royal game-keeper: but no man, not even a lord of a manor, could by common law juftify fporting on another's foil, or even in his own, unlefs he had the liberty of free-warren. This franchife is almoft fallen into difregard, fince the new ftatutes for preferving the game. There are, indeed, many inftances of eager fportfmen in ancient times, who have fold their eftates, and referved the free-warren, or right of killing game, to themfelves; by which means it comes to pafs that a man and his heirs have fometimes free-warren over another's ground.

By a ftatute, 21 Edw. III., a warren may lie open, and there is no need of clofing it in; as there is of a park.

If any perfon be found an offender in any fuch free-warren, he is punifhable for the fame at common law. See BLACK *Act*, and GAME.

The word warren is now generally applied to a piece of ground fet apart for the breeding and preferving of rabbits.

In the fetting up of a warren, great caution is to be ufed for the fixing upon a proper place, and a right fituation. It fhould always be upon a fmall afcent, and expofed to the eaft or the fouth. The foil that is moft fuitable, is that which is fandy; for when the foil is clayey or tough, the rabbits find much more difficulty in making their burrows, and never do it fo well; and if the foil be boggy or moorifh, there

there would be very little advantage from the warren, for wet is very deſtructive of theſe animals.

All the due precautions muſt be taken, that the warren be ſo contrived, that the rabbits may habituate themſelves to it with eaſe. Many would have it that warrens ſhould be encloſed with walls; but this is a very expenſive method, and ſeems not neceſſary nor adviſeable; for we find but very few that are ſo, and thoſe do not ſucceed at all the better for it.

Mr. Chomel's opinion is, that it ought to be ſurrounded with a ditch. This indeed is no fence to prevent the rabbits from going out, unleſs there be water in it; but it marks the intended bounds of the warren, and the rabbits generally confine themſelves within its circumference, though not neceſſarily compelled to do ſo. The ſpace proper for a warren has no limits but the owner's pleaſure; but, in general, the larger it is, the more profitable it alſo proves; and the rabbits, when once accuſtomed to the place, will keep within their bounds, though they are hemmed in neither with walls nor ditches, nor any other fence whatever.

Some have preſcribed the making of deep ditches, and conſtantly keeping them ſupplied with water in the ſummer as well as winter ſeaſon, that they may ſerve as fences to the rabbits; but as it is not found neceſſary to fence them in at all, it is extremely injudicious to do it, by means of a thing known to be ſo very prejudicial to theſe creatures as water is. If the perſon who has ſet up a warren has but few rabbits to ſtock it with, the more patience he muſt have as to the profit of it; but the beſt method of getting quickly into the ſcheme of profit in it, is the buying at firſt a large number of doe-rabbits all big with young. Theſe being unwieldy and heavy, will naturally ſtay in the place, and the young ones will be habituated to it, as their native place, and will never run from it. Theſe young ones will ſoon breed again, and the warren will begin quickly to be ſtocked with inhabitants, almoſt all natives of the place. They ſhould not be hunted at all the two firſt years, and but very moderately the third. After this they will increaſe ſo faſt, that ſcarce any body can conceive the numbers that may be taken, and the profit that may be annually made without hurting it.

The warren is the next franchiſe in degree to the park, and when ſpoken of in law, the terms uſed are, the liberty and franchiſe of a free-warren.

A foreſt, which is in dignity the higheſt and greateſt franchiſe, comprehends in it a chaſe, a park, and a free-warren; for which reaſon the beaſts of the park, and the beaſts and fowls of the free-warren, are as much privileged within the foreſt, as the beaſts of the foreſt itſelf are.

Warren is alſo applied to a contrivance for preſerving fiſh in the midſt of a river, to be taken at pleaſure.

Warren, in *Geography*, a poſt-townſhip of New York, in the S.E. corner of Herkimer county; 10 miles S. of Herkimer, and 70 W. of Albany. The ſituation is elevated at the head of the lakes that form the Suſquehanna, and the ſurface pleaſantly undulated by arable hills and fertile valleys; and it has many cedar ſwamps that ſupply fencing-timber. The rocks are calcareous, and much of the ſoil of the ſame quality. There are large ſprings, but the waters of the town are ſmall; it has five grain-mills, nine ſaw-mills, a carding-machine, a forge, and trip-hammer. It has one meeting-houſe belonging to united Lutherans, Calviniſts, and Preſbyterians, and a competent number of ſchool-houſes. Iron-ore is found, and a pigment from which is prepared a durable brown paint. The principal ſettlements in this town have been made within the laſt twenty-five years. In 1810 Warren contained 664 families, 444 ſenatorial electors, and a total population of 3974 perſons.—Alſo, a county of Weſt Tenneſſee, containing 5725 inhabitants, of whom 476 are ſlaves.—Alſo, a town of the Miſſiſſippi territory, containing 1114 inhabitants, including 473 ſlaves.—Alſo, a town of the ſtate of Rhode iſland, in Briſtol county, containing 1775 inhabitants; 4 miles N. of Briſtol.—Alſo, a poſt-town of the diſtrict of Maine, in the county of Lincoln, near the coaſt, containing 1443 inhabitants; 55 miles N.E. of Portland.—Alſo, a town of New Hampſhire, in Grafton county, containing 506 inhabitants; 16 miles N. of Hanover.—Alſo, a townſhip of New York; 55 miles W. of Albany.—Alſo, a town of Connecticut, in the county of Lichfield, containing 1096 inhabitants; 5 miles W. of Lichfield.—Alſo, a county of Georgia, with 8725 inhabitants, of whom 3048 are ſlaves.—Alſo, a county of the ſtate of Ohio, containing five townſhips, *viz.* Deerfield, Franklin, Turtle-creek, Hamilton, and Wayne, and 9925 inhabitants.—Alſo, a county of Pennſylvania, bordering on the weſt part of New York. It contains two townſhips, *viz.* Conewango and Broken-ſtraw, and 827 inhabitants.—Alſo, a county of Kentucky, bordering on the Ohio, containing 11,783 inhabitants, of whom 1447 are ſlaves; and its town Bolin Green 154 inhabitants, including 51 ſlaves.—Alſo, a town of the ſtate of Vermont, in the county of Addiſon, containing 229 inhabitants; 30 miles N. of Rutland.—Alſo, a poſt-town of Virginia; 178 miles W.S.W. of Waſhington.—Alſo, a town of the ſtate of Ohio, with a gaol, in the county of Belmont, containing 734 inhabitants.—Alſo, a townſhip, in the ſtate of Ohio, and county of Jefferſon, containing 2122 inhabitants.—Alſo, a townſhip of Ohio, in the county of Trumbull, containing 875 inhabitants.—Alſo, a townſhip of Ohio, in Waſhington county, containing 260 inhabitants.—Alſo, a county of North Carolina, with 11,044 inhabitants, of whom 6282 are ſlaves.—Alſo, a town of New Jerſey, in the county of Somerſet, containing 1354 inhabitants.

Warren, or *Warentown*, a poſt-town of North Carolina, and capital of the county of Warren; 16 miles N.E. of Hillſborough.

Warren, *Fort*, in Governor's iſland, is ſituated in Suffolk county, and ſtate of Maſſachuſetts, within the juriſdiction of Boſton, and contains 64 inhabitants.

Warren's *Iſland*, an iſland in the Pacific ocean, at the entrance of the Duke of Clarence's ſtraits, near the weſt coaſt of the Prince of Wales's archipelago, ſo called by captain Vancouver, in compliment to ſir John Borlaſe Warren. N. lat. 55° 56′. E. long. 226° 22′.

Warren's *Point*, or *Waring's Point*, a poſt-town of the county of Down, Ireland, ſituate upon the bay of Carlingford; 5½ miles from Newry, and 55½ N. from Dublin.

WARRENTON, a poſt-town of Georgia, in the county of Warren; 68 miles S. of Waſhington.

WARRI, a town of Hindooſtan, in the Carnatic; 10 miles S. of Golconda.

WARRINGTON, a large, populous manufacturing town in the hundred of Weſt Derby, and county palatine of Lancaſter, England, is ſeated on the northern bank of the river Merſey, about midway between Mancheſter and Liverpool, at the diſtance of 51 miles S. by E. from the county-town, and 187 miles N.W. by N. from London. Some authors have contended that a Roman ſtation was eſtabliſhed here, as a guard to the ford; but no particular diſcoveries have been made to juſtify this opinion. Leland deſcribes Warrington as "a paved town of pretty bigneſs, with a chirche at the taile end of al the tounne: it is a better market than Mancheſtre." The town of Warrington conſiſts of four principal ſtreets, which are long, narrow, ill built, crowded with carts and paſſengers, and unpleaſant to the inhabitants;

inhabitants; but, a few modern buildings being interfperfed, afford a ftriking mixture of mean and handfome houfes. According to the population return of the year 1811, the town contained 2639 houfes and 11,728 inhabitants. A charter for a market and two fairs was obtained in the reign of Edward I. by fir Thomas Boteler, of Bewfey, where a moated manfion ftill remains. The market-day is Wednefday. The principal trade of the place confifts in the manufacture and fale of fail-cloth, or poledavy; but fome coarfe linens and checks are made in the town and in its vicinity. The former is chiefly compofed of hemp and flax mixed, and fome forts are manufactured with flax alone: the raw materials are moftly brought from Ruffia, and imported into Liverpool, whence to Warrington is a cheap and expeditious water carriage by the Merfey. Among other manufactures of this place, may be fpecified pin-making, glafs-making, and iron-founding. Warrington may, in fome meafure, be confidered as a port-town, the Merfey admitting, by the help of the tide, veffels of feventy or eighty tons burthen to Bank Quay, a little below the town, where warehoufes, cranes, and other conveniences for landing goods, are erected. The fpring-tides rife to the height of nine feet. Upwards, the river communication extends to Manchefter. The parifh-church of Warrington is an ancient ftructure, and contains many old handfome monuments: here is alfo a chapel of eafe, erected in 1760: likewife places of worfhip for Catholics, Prefbyterians, Anabaptifts, Methodifts, and Quakers. A well-endowed free-fchool is eftablifhed here; and a charity-fchool for educating and maintaining poor children of both fexes. About the middle of the laft century, a feminary for educating youth on a liberal academical plan was inftituted, and fupported by fubfcriptions, chiefly among the Diffenters: it was denominated the Warrington Academy, and flourifhed a confiderable period under the care of tutors of eminence; but at length funk, through want of adequate fupport, and the difficulties in maintaining proper difcipline. A ftone bridge croffes the Merfey from Warrington, built by the earl of Derby in the reign of Henry VII. As there is no other bridge over the Merfey between this place and Liverpool, nor for many miles eaft of it towards Manchefter, the pafs here has been a poft of confequence in the civil commotions of this kingdom. The moft memorable event of this kind occurred in 1648, when a large body of the fugitive Scotch army, under the duke of Hamilton, was purfued from Ribbleton-moor; and though they made an obftinate refiftance for fome hours at this bridge, yet above 1000 men were killed, and 2000 taken prifoners. Again, in 1651, general Lambert, who commanded on the former occafion, fixed on this fpot to oppofe the Scotch army under the young king, who was here repulfed. In the year 1745 alfo, the middle arches of the bridge were broken down, to check the progrefs of the rebels, and reftored again on the termination of the infurrection.—Beauties of England and Wales, vol. ix. Lancafhire. By J. Britton, F.S.A. 1807. Aikin's Defcription of the Country round Manchefter, 4to. 1795.

WARRINGTON, a townfhip of Pennfylvania, in the county of York, containing 1105 inhabitants.—Alfo, a townfhip of Pennfylvania, in Bucks county, containing 429 inhabitants; 20 miles N.N.E. of Philadelphia.

WARRIOR, MARK, a townfhip of Pennfylvania, in Huntingdon county, containing 672 inhabitants.

WARRIORE, a town of Hindooftan, in the Carnatic; 32 miles N.N.E. of Tanjore. N. lat. 11° 16′. E. long. 79° 25′.

WARRIORS' BRANCH. See RED *River*.

WARSAW, a city of Saxony, and capital of a duchy, late a city of Poland, and capital of the palatinate of Mafovia, fituated on the Viftula, almoft in the centre of the kingdom. It is furrounded with a moat and double wall, and confifts of Old and New Town, and two fuburbs, Kraka and Praga. The general diets of Poland were ufually held here, as well as the provincial affembly, and court of judicature. Here are feveral elegant ftone buildings and palaces, a great number of beautiful churches and convents, a hofpital, and an arfenal. King Sigifmund III. was the firft who made this city the royal refidence, and his fucceffors refided here ever after. In the year 1569, in order to gratify the Lithuanians, the diet was removed to Warfaw.' The Poles laid fiege to it in the year 1656, and after a moft vigorous defence, obliged the town to furrender. By the articles of capitulation, the Swedes were permitted to leave the place; but the beft part of the plunder they had amaffed together fell into the hands of the Poles. However, Charles Guftavus approaching with an army to the relief of the town, king John Cafimir marched againft him, and a battle was fought near the fuburb of Praga, which lafted three days. At laft the Poles were obliged to retreat, leaving behind them their baggage and artillery, upon which the Swedes placed a fmall garrifon in the town, and deftroyed the fortifications. In the year 1702, Charles XII. of Sweden made himfelf mafter of Warfaw, which happened to be then without a garrifon, and fixed his head-quarters at Praga. In the month of June 1794, the king of Pruffia laid fiege to Warfaw; but on a rumour of difturbances in his own dominions, his forces were, after a fruitlefs attempt for three months, withdrawn. The Ruffians afterwards fummoned Warfaw to furrender, and on being refufed, after the junction of the different corps under Ferfen, Dernfeld, Denifow, and Suwarrow, they proceeded, on the 4th of November, to attack the fuburbs of Praga. In the mean time, the generals Madalinfki and Dambrowfki threw themfelves into Warfaw, and prepared for refiftance. The fuburb of Praga was defended by more than a hundred pieces of cannon, difpofed upon thirty-three batteries. Little intimidated by fo formidable a force, the ferocious Suwarrow commanded his foldiers to mount to the affault in the fame manner they had done at Ifmail, by climbing over the dead and wounded bodies of their comrades, as well as of their enemies. His farther commands were, that they fhould fight only with the fabre and bayonet. The Ruffians fprung to the charge with almoft inconceivable impetuofity; they eagerly began to climb the works, and the fix Ruffian columns, by fingular good fortune, prefented themfelves at the fame moment before the lines of Praga. Thus furrounded, the Polifh generals found themfelves unable to oppofe with 10,000 foldiers, which was the whole of their force, the united attack of 50,000 men: and to add to their diftrefs, the fire which they immediately commenced, from the darknefs of the night, was fo ill directed, as to pafs over the heads of the affailants. The cry raifed by the fuccefsful columns penetrated to the intrenchments on the other fide of the Viftula, and added to the confternation of the Poles engaged with the other part of the Ruffian force; and they endeavoured to find fafety by retiring into Warfaw, over a bridge. In their retreat they were met by another body of Ruffians, and a dreadful carnage enfued, in which a great part of the garrifon of Praga was miferably flaughtered. After a fevere conflict of eight hours, the refiftance on the part of the Poles ceafed; but the maffacre lafted for two hours longer, and the pillage lafted till noon on the following day. Five thoufand Poles were computed to have been flain in the affault, the remainder were either imprifoned or difperfed. The citizens were compelled to lay down their arms, and their houfes were plundered by the mercilefs Ruffians; who, after the battle had

had ceased nearly ten hours, about nine o'clock at night set fire to the town, and began to massacre the inhabitants; 9000 persons, unarmed men, defenceless women, and harmless infants, perished either in flames or by the sword, and nearly the whole of the suburb was reduced to ashes. In the whole of this siege, it is computed that not less than 30,000 of the Poles were inhumanly put to death. It was soon after given up to Prussia, and with the rest of Masovia continued subject to that power, until by the peace of Tilsit, this part of Poland, which had been seized by Prussia since the year 1772, was given to Saxony, and formed into a principality under the title of the duchy of Warsaw; 150 miles S. of Königsberg. N. lat. 52° 12′. E. long. 21° 9′.

Warsaw, a duchy annexed to Saxony, formed out of that part of Poland which had been seized by Prussia after the year 1772. It was united to the empire of Russia by the Vienna congress in 1815: that part called the grand duchy of Posen is to be possessed in full sovereignty and property of the king of Prussia.

Warsaw, a post-township of New York, in Genessee county; 260 miles from Albany. It is a good tract of land, and comprises three townships. In 1810 there were 201 senatorial electors, and the whole population is stated at 1317 persons.

Warsaw. See Wassaw.

WARSIMOW, a town of Poland, in the palatinate of Brzesc; 32 miles W. of Brzesc.

WARSOWKA, a town of Poland, in Volhynia; 48 miles N.E. of Zytomirz.

WARSTEN, a town of Germany, in the duchy of Westphalia; 3 miles S.W. of Rhuden.

WART, in Latin *verruca*, denotes, in *Surgery*, a kind of excrescence from the cutis, or true skin, covered with a production of cuticle, which is strong and hard, or more delicate, according to the natural quality of the cuticle which is spread over the surrounding integuments. In the arrangement of Drs. Willan and Bateman, warts constitute a genus of the order *tubercula*. Some warts are connected with the skin by pedicles; while others have a broad base. They are most frequently moveable; but sometimes they are firmly fixed to the subjacent parts. Their general size does not exceed that of a pea. Much larger ones, however, often form about the anus, perineum, and pudenda. Sometimes the excrescence is single; sometimes it presents itself in large numbers, occupying different situations in the body, though most frequently occurring on the hands and face. The complaint, as every body knows, is much more common in children and young persons, than in people more advanced in life. As Mr. Hunter observes, warts are radiated from their basis to their circumference. The surface of the radii appears to be pointed, or granulated, like the surface of healthy granulations, with the exception of being harder, and rising higher. The surface on which a wart is formed, appears to be capable of producing only one such tumour; for the surrounding and connecting surface does not throw out a similar substance. Thus, when a wart has once begun to grow, it rises higher and higher, without becoming larger at its basis. Such excrescences seem to have within themselves the power of growing larger; for, after they have risen above the surface of the skin, on which their basis cannot grow larger, they swell out into a round thick substance, which becomes rougher and rougher. In consequence of having this structure, warts are very liable to be hurt by bodies rubbing against them, by which means they are sometimes made to bleed very profusely, and to become sore and painful.

Almost all writers on surgery consider warts as depending upon causes which are sometimes quite *local*, and, in other instances, *general*, or *constitutional*. The opinion, that many of these excrescences arise from constitutional causes, is supported chiefly by the following facts: first, Many warts, growing about the pudenda, anus, &c. reputed to be venereal, and certainly very often yielding to mercury, seem to favour the doctrine, that such excrescences are a consequence of syphilis, and true venereal complaints. Secondly, The circumstance of warts growing in large numbers, and often recurring in a very short time after their removal, has strengthened this mode of thinking. Thirdly, The unquestionable greater propensity to warts observable in young subjects than in elderly persons, is another fact which affords a strong argument in support of the opinion. Indeed, we believe that, in particular habits, a disposition to the formation of warts must be admitted as a positive truth, and of course we cannot reject the doctrine, that these excrescences frequently arise from certain states of the constitution. With respect to venereal warts, we have always doubted the reality of their existence; because, although we know that many such tumours may be cured by a course of mercury, we have never met with any which could not be dispersed or destroyed by escharotics, the ligature, or the knife.

Warts are generally quite free from all risk of any serious consequences; but, on account of their size and situation, they frequently give trouble, and occasion deformity; and sometimes, when they are irritated, they are attended with considerable inflammation, and even obstinate ulcerations.

In the treatment of warts one thing is to be recollected; *viz.* that they are adventitious substances not constituting any original part of the body, and therefore possessing only an inferior degree of vitality. Hence, when stimulated, they generally diminish or separate in sloughs. Another circumstance seems also particularly deserving of the surgeon's recollection; namely, that warts will always grow again, if any part of them be left behind unextirpated.

When warts are dependent upon constitutional causes, writers on surgery agree in recommending the internal exhibition of alterative medicines. In particular, they enjoin a change of diet, with the use of resolvent or mercurial remedies; or such other means as seem best calculated to obviate the cause of the complaint. When the state of the constitution has been rectified, the warts frequently disappear of themselves. The tendency to warts observable in young persons, spontaneously ceases as they grow older; and, in them, after the adult age, how common is it to find warts disappearing of themselves, though they had previously resisted every ordinary means of cure!

When warts are altogether dependent upon a local cause, they can be most effectually treated by external applications. Should the wart have a narrow neck, or pedicle, it may be made to fall off by constricting the part near its root with a fine silk ligature, or a piece of horse-hair, which is to be rendered gradually tighter. However, although this plan answers very well, and sometimes does not give so much alarm as the use of a cutting instrument, the same sort of warts may also be still more expeditiously removed with a knife, or a pair of scissars. When a wart is large and has a very broad base, if an attempt is to be made to destroy it with a ligature, the surgeon must pass a double ligature through the centre of its root, or pedicle, and then tie each half of the silk separately over the two portions of the excrescence. Were an endeavour made to extirpate a wart with a large base by a single ligature, the process would be tedious, painful, and often ineffectual.

Warts with a broad attachment, however, are unfavourable

able for the ligature; and it is generally best in such cases, either to have recourse to stimulating applications, escharotics, or cutting instruments.

Rubbing warts with soapy liniments, or lotions containing the muriate of ammonia, vinegar, the muriate of soda, the liquor ammoniæ, &c. frequently brings about their gradual removal by absorption. The stimulating properties of the juice of a variety of herbs also have the same effect, as well as the school-boy's practice of smearing them continually with ink.

A more certain method, however, is to attack warts with escharotic and caustic applications, such as the tincture of cantharides, the plaster of cantharides, the pulv. cantharidum et æruginis æris, the nitrate of silver, muriate of antimony, sulphate of copper, concentrated mineral acids, &c. In the use of the stronger caustics, it is necessary to protect the surrounding skin from their action by covering it with adhesive plaster. The surgeon must also be cautious in their use, lest he excite very painful and troublesome sores.

When warts are very large, we conceive it best to cut them away, and apply the lunar caustic to the surface from which they grew. In doing this operation, let the surgeon always remember, that removing only a part of the wart is worse than doing nothing; since the portion left behind will afterwards grow with increased rapidity. Hence, when warts have been removed either with ligatures, or cutting instruments, it is generally prudent to touch the situation of their roots with some active caustic.

Warts, in *Animals*, the horny excrescences which are formed in the skin of different parts of them, and which are caused by any thing that hardens it in a local manner. In horses, they are said to be of the same nature as those excrescences that take place on their legs and pasterns, and to be more or less hurtful, as they may be situated nearer to, or at a greater distance from, the larger sinews of the parts. See *Rat*-Tails, Scratches, &c.

In regard to the removal of them, they are capable of being destroyed by touching them occasionally with any powerful caustic substance, by the use of ligatures, and by being cut off, in some cases, when superficially situated. In the first of these intentions, three ounces of the powder of copperas are directed to be put into a crucible, and placed on a charcoal fire, keeping the powder stirred from time to time, but being careful to avoid the steam; continuing a pretty strong heat until the powder grows somewhat reddish; when it is to be taken off the fire, and after it is cooled broken, the parts being beaten and reduced into a very fine powder; some of which is then to be incorporated with some soft unctuous material, and an ointment formed; which is to be applied cold to the warts, anointing them lightly with it every day, when they will soon, it is said, fall off in the manner of the kernels of nuts, without causing any sort of swelling or uneasiness. Care is, however, to be taken not to touch any thing but the warts. And if the animal be a horse, he should not be wrought or rode during the application of the ointment or caustic.

The other modes of cure are equally easy and effectual in many cases of warts in animals.

Wart, in the *Manege*, is an excrescence, or superfluity of spongy flesh, that rises in the hinder pasterns of coach-horses, almost as big as a walnut. It suppurates, and voids red stinking matter, and does not heal but for a time, for it returns again. See the preceding article.

Wart-*Wort*, in *Botany*, a name sometimes given to two very different plants. See Nipple-*Wort* and Spurge.

Wart-*Wort*, in *Gardening*, the common name of a thick-leaved plant, which is studded with hard warty knobs or knots. See Euphorbia.

WARTA, in *Geography*, a town of the duchy of Warsaw, on a river of the same name, which runs into the Oder; 10 miles N.N.E. of Siradia.—Also, a town of Silesia, in the principality of Neisse; 5 miles E. of Neisse.—Also, a river which rises near Cracow, and runs into the Oder at Custrin.

WARTAU, a town of Switzerland, in the county of Sargans; 20 miles N. of Sargans.

WARTBERG, a town of Austria; 7 miles N.E. of Steyregg.

WARTBURG, a town of Switzerland, in the canton of Soleure; 16 miles N.E. of Soleure.

Wartburg, or *Wartenburg*, a castle of Saxony, in which Martin Luther was imprisoned eleven months, near Eisenach.

WARTENBERG, a town of Bavaria, on the Strong; 4 miles S.E. of Mosspurg.—Also, a town of Silesia, and capital of a lordship of the same name, containing scarcely above 100 houses. It was formerly much larger; but in the year 1444, 580 houses were destroyed by fire. The circle was afterwards contracted, and the town surrounded with a rampart, wall, and moat. The Roman Catholics, the Lutherans, and the Calvinists, have each a place of worship; 14 miles N.E. of Oels. N. lat. 51° 18′. E. long. 17° 45′.—Also, a town of Bohemia, in the circle of Boleslaw; 4 miles N.E. of Nimes.—Also, a lordship of Silesia, surrounded by the principality of Oels, to which it once belonged, but was erected into a particular lordship in the year 1490; it has frequently changed proprietors, and lately belonged to the duke of Courland.

WARTENBURG, a town of Austria; 1 mile N.W. of Voglabruck.—Also, a town of Prussia, in the province of Ermeland; 63 miles S. of Königsberg. N. lat. 53° 43′. E. long. 20° 40′.—Also, a town of Vermont, in the county of Chittenden, containing 866 inhabitants.—Also, a castle of France, in the department of Mont Tonnerre, late in the circle of the Upper Rhine, which gave name to a county, the lands of which were not united together, but lay in detached parts. It was made an imperial county in the year 1707. The castle is situated 6 miles N.E. of Lautern.

WARTH, in our *Old Writers*, seems to be the same with ward-penny, being a customary payment for some castle-guard.

WARTHA, in *Geography*, a town of Silesia, in the principality of Munsterberg, on the Neisse; 6 miles N.E. of Glatz. N. lat. 50° 20′. E. long. 16° 35′.

WARTHEBERG, a town of Austria; 13 miles S.W. of Steyr.

WARTHENBERG, a town of Silesia, in the principality of Glogau; 18 miles N.W. of Gros Glogau. N. lat. 51° 52′. E. long. 15° 45′.

WARTHENBURG, a town of Saxony; 6 miles S.E. of Wittenberg.

WARTON, Joseph, D.D., in *Biography*, son of the poetry-professor of the same name at Oxford, and vicar of Basingstoke, was born in 1722, and entered at the age of fourteen years on the foundation at Winchester-school, and in 1740 at Oriel college, Oxford. After having taken the degree of B.D. he became curate to his father, and in 1744 exercised the same office at Chelsea. In this year he published a small volume of "Odes," and in 1748 he was presented by the duke of Bolton to the rectory of Winslade, and soon after married. In 1751 he accompanied his patron on a tour to the south of France, and in 1753 completed his edition

edition of Virgil in Latin and English; the Æneid being in Pitt's translation, and the Eclogues and Georgics in his own; adding notes and three essays on pastoral, didactic, and epic poetry. His translations are characterized as superior in accuracy to Dryden's, and in poetry to Trapp's, but not distinguished by spirit or brilliancy. To the "Adventurer" he became a contributor, by the recommendation of Dr. Johnson, of twenty-four papers, which were of an humorous cast, and mostly essays on critical topics. In 1754 he was presented to the rectory of Tamworth, and in the following year became second master of Winchester-school. In 1756 he published, without his name, an "Essay on the Writings and Genius of Pope," in which he intermixes praise with reflections that tend to degrade this poet to the class of those who have been votaries of reason rather than of imagination. Failing to convince the public that his estimate of his talents was just, he deferred the publication of his second volume for twenty-six years. In 1766 he was advanced to the station of head-master of Winchester-school, which he long occupied with distinguished reputation, and in which he formed many scholars, who afterwards rose to literary eminence, and retained a grateful sense of his tuition. On this promotion he visited Oxford, and was honoured with the degrees of bachelor and doctor of divinity. His subsequent preferments were numerous but small, and he obtained them late in life: in 1782, the friendship of bishop Lowth procured for him a prebend of St. Paul's, and the living of Thorley in Hertfordshire; and in 1788 he was advanced to a prebend of Winchester and the rectory of Easton. In 1793 he resigned his mastership of Winchester-school, and retired to the rectory of Wickham, which he enjoyed in exchange for another. As he was fond of literary employment, he was engaged by the booksellers to superintend an edition of Pope's Works, which appeared in 9 vols. 8vo. in 1797, with notes critical and biographical, partly selected from his former essay, and a life of the poet. When this work was finished, he undertook an edition of Dryden, and had prepared two volumes at the time of his death, which happened in February 1800, in his 78th year. He was twice married, and left one son and three daughters. In his private character, says his biographer, he was amiable, and in social life no less estimable than in his literary connections. The Wickhamites, gentlemen who had been educated at Winchester-school, testified their respect for his memory by erecting a monument over his tomb in Winchester cathedral. His "Ode to Fancy," first printed in Dodsley's Collection, is thought to have been most admired, and to afford the fairest specimen of his talents. Gen. Biog.

Warton, Thomas, brother of the preceding, was born at Basingstoke in 1728, and manifested, by his translation of an epigram of Martial in his ninth year, an early taste for versification. In 1743 he was admitted a commoner of Trinity college, Oxford, where he distinguished himself, in his twenty-first year, by his "Triumph of Isis," in vindication of the university against the reflections of Mason's elegy of "Isis." This poem, however, he afterwards excluded from his volume of collected pieces. His "Progress of Discontent," said to have been written as a college-exercise in 1746, gained him reputation. Having taken his degree of M.A. in 1750, he became in the following year a fellow of his college; and seems to have formed his purpose of university-residence, and of devoting himself to poetry and elegant literature. Besides his "Newmarket," a spirited satire against the ruinous passion for the turf; his ode for Music; Verses on the death of the prince of Wales; and his editorship, in 1753, of a collection of poems, entitled the "Union," and containing several of his own pieces, severally contributed to his reputation; but his observations on Spenser's Fairy Queen, published in 1754, first in one volume and afterwards in two volumes, were of more essential service in making him known as a critic, and as conversant with poetical antiquities; and prepared the way for his election, in 1757, to the office of professor of poetry to the university, which he occupied for ten years, with an erudition and taste that rendered his lectures instructive and amusing. Our limits will not allow us to enumerate his various publications, but we shall proceed to other details of greater importance. Having taken the degree of B.D. in 1761, he was instituted to the small living of Kiddington, in Oxfordshire, in 1771. His edition of Theocritus, in 2 vols. 4to., was published in 1770, and very much contributed to his literary celebrity both at home and on the continent. It was probably about this time that he formed a design of writing a "History of Poetry," which had been contemplated by Pope, Gray, and Mason. However, the first volume in quarto was published in 1774, the second appeared in 1778, and a third was presented to the public in 1781. His plan was much more extensive, and intended to terminate only with the commencement of the eighteenth century; but he became tired of the task, and wished for relaxation, so that he prepared only a few sheets of a fourth volume. This *Opus Magnum*, as it may be well denominated, exhibits an extent of research and reading, and a correctness of taste and critical judgment, which do him great honour; and we may justly regret that he did not finish it, and that no one, equal to the undertaking, has had resolution to prosecute and complete it. In such a comprehensive and multifarious work, some inaccuracies are unavoidable; but the most fastidious critic must acknowledge, that it abounds with curious and interesting information. In 1781 he projected a county history of Oxfordshire, and in 1782 he published a specimen of his undertaking in a topographical account of his parish of Kiddington; but he was probably discouraged by the magnitude and labour of such a work. In this year he took part in the controversy concerning Rowley's poems, which he decidedly pronounced to be the fabrication of their pretended editor. His views with regard to promotion were restricted; however, his income was at this time increased by a donative in Somersetshire, and in 1785 by the office of Camden-professor of history at Oxford; and soon after by the king's offer of the post of poet-laureat, which he accepted with a design of rendering it respectable. As the indolence of age and of a collegiate life was advancing upon him, he no longer indulged extensive views and projected great undertakings, but he contented himself with accomplishing a task which to him must have been very easy, and that was an edition of Milton's juvenile poems, with notes for illustrating their beauties and explaining their obsolete and peculiar phraseology. The first edition appeared in 1785, and the second in 1791, a little while before his death. In his 62d year he was attacked with a paroxysm of the gout, and this was succeeded in May 1790 by a paralytic seizure, which terminated his life at his lodgings in Oxford. His remains were interred, with every academical honour, at the chapel of Trinity college. Although his character was marked by some peculiarities, he is said to have been substantially good-humoured, friendly, and placid. Several editions of his poems appeared in his life-time; and since his death an edition of his works has been given by Mr. Mant, in 2 vols. 8vo. 1802, to which is prefixed a biographical account of the author. Nichols's Liter. Anecd. Gen. Biog.

Musical historians have considerable obligations to this poetical antiquary: as in his long, extensive, and diligent researches, he has furnished them with anecdotes and narratives

tives concerning the harpers and minstrels of our country, and the high estimation in which the former stood with our princes and the latter with the nobility, till they became so numerous and licentious, that they lost the favour of the great, and reverence of the vulgar. Till about the end of queen Elizabeth's reign, there was no great personage who had not a band of musicians attached to his household, and a choir to his chapel, in England; in Ireland and Wales a domestic harper, and in Scotland a bagpiper domiciliated. The late lord Marshal, who had a very good taste in Italian vocal and German instrumental music, had a Scots bagpiper in his service at Potzdam and elsewhere, till the time of his decease. The laureat and Oxford poetry-professor was fond of music, and loved to be talking and writing on the subject; and in his history of poetry has kept back nothing which he accidentally found in the course of his other inquiries. As Milton's minora perhaps delight the generality of his readers more than his sublime epics, so the ballads and smaller pieces of T. Warton were in more general favour than those of length, upon graver subjects, which had cost him more meditation and midnight oil.

WARTON, or WHARTON, in *Geography*, a township of Pennsylvania, in the county of Fayette, containing 922 inhabitants.

WARWICK, the county-town of Warwickshire, England, is situated in the Warwick division of the hundred of Kington, on a rocky eminence on the banks of the Avon, near the centre of the county, at the distance of 10 miles S.S.W. from Coventry, and 90 miles N.W. from London. It is a neat pleasant town, enriched with a castle of stupendous grandeur, and several public buildings possessing great attractions. Dugdale, and more early writers, conjectured this to be a Roman station, but no vestiges have been found, or other circumstances shewn, to strengthen the supposition, and its origin has been assigned to the Saxon era. Dugdale shews, from several authorities, that this town was highly favoured by the patronage of Ethelfleda, daughter of king Alfred, who in the year 915 constructed a fortified building (termed the Dungeon) on the artificial mount, which still remains on the west side of the castle; and that the town, under such protection, advanced rapidly in population and repute. In Domesday-book it is called a borough, and is there stated to contain 261 houses. The same record states, that in the time of Edward the Confessor, a castle was erected here, which belonged to the crown; that it was "a special strong hold for the midland part of the kingdom," and that Turkill was appointed governor. When William the Conqueror obtained the crown, he ordered Turkill, who was vicecomes of Warwick, to fortify and enlarge the castle, which at that time consisted of little more than the keep or dungeon. The king afterwards gave the castle to his adherent, Henry de Newburgh, whom he created earl of Warwick; and under the patronage of this nobleman, and a long line of descendants, the town advanced in importance and prosperity, and obtained many privileges and immunities. The paving of the town, and the building of the walls, commenced in the latter part of Edward I.'s reign, and the expence was defrayed by several tolls granted in this and the two following reigns; but these proving very prejudicial to the markets and trade, were abolished in the thirty-second year of Edward III. The appearance of the town in the reign of Henry VIII. is thus described by Leland: "The toun of Warwick hath been right strongly defended and walled, having a compass of a good mile within the wall. The dike is most manifestly perceived from the castle to the west gate, and there is a great crest of earth that the wall stood on. Within the precincts of the toun is but one paroche church, dedicated to St. Mary, standing in the middle of the toun, fair and large. The toun stands on a main rokky hill, rising from east to west. The beauty and glory of it is in two streets, whereof the High-street goes from east to west, having a right goodly cross in the middle of it; and the other crossith the middle of it, maketh a quadrivium, and goeth from north to south." A charter of incorporation was granted to the burgesses in the first year of Philip and Mary; and in the year 1572 the town received a visit from queen Elizabeth, an account of which is preserved in a curious manuscript, called the Black Book, which is in the possession of the corporation. The active part taken by lord Brooke in the civil wars of the seventeenth century, produced here, as might be expected, great confusion and dismay. The castle was placed in a regular state of garrison; at one period it sustained a siege, and several skirmishes took place in the neighbourhood. In the year 1694, the greater part of the town, including the High-street, and nearly the whole of St. Mary's church, was consumed by fire; and 120,000*l.* were collected by briefs, a royal grant, and private subscriptions. The town was rebuilt by act of parliament in a more commodious form, partly of free-stone, from the rock on which it stands. It now consists principally of two streets: the High-street, which is spacious and handsome, is formed in a direct line from east to west, with an ancient gateway at each extremity; that at the west end is surmounted by a chapel. The two churches which now ornament the town are those of St. Mary and St. Nicholas. A church, having a similar dedication to the former, occupied the same spot before the Conquest. Henry de Newburgh, the first earl of Warwick of the Norman line, formed the design of making it collegiate, which was carried into execution by his son, earl Roger, in the year 1123. The latter bestowed on the associated canons tithes and other property of considerable value, and his successors, the earls of Warwick, and other benefactors, continued to protect and foster them during several ages. Through the munificence of the earls of Warwick, St. Mary's church was rebuilt in the fourteenth century. The choir was commenced by the first Thomas de Beauchamp, the earl so much distinguished in the French and Scottish wars of Edward III., and the whole structure was completed by his son, of the same name, in the year 1394. At the dissolution, this church was granted by letters patent to the inhabitants of Warwick and their successors. The great fire of 1694, as before observed, consumed the greater portion of this church. In the middle of the choir is an altar-tomb to Thomas Beauchamp, earl of Warwick, who died Nov. 13, 1370, and his wife, Catherine, daughter of Roger Mortimer, first earl of March. This monument is pronounced by Mr. Gough to be one of the most beautiful of its kind in the kingdom. On the south side of this church is St. Mary's chapel, usually termed the Beauchamp chapel, which was erected according to the directions of the will of Richard Beauchamp, earl of Warwick: it was begun in 1443, and was finished in the year 1464. The total expence of the structure, including the tomb of the founder, was 2481*l.* 4*s.* 7*d.*, equal at present to more than twenty times that sum; wheat being then only 3*s.* 4*d.* *per* quarter. The architecture and decorations of this chapel are at once very beautiful and interesting. It consists of one oblong apartment, having one large window at the east end, three others on the south and north sides, a door of entrance from the west, a richly ornamented altar-screen at the east end, some carved seats, and three oratories, or inclosed seats, on the north side. Nearly in the centre of the chapel is a large and elegant altar-tomb, for the founder, whose effigy in brass, very finely executed, is laid on the top. Of this curious tomb and chapel some interesting documents are preserved and published in the "Architectural Antiquities of Great

Great Britain," which contains a plan, sections, and views of the building.

St. Nicholas church is a recent structure, though a religious edifice stood on the same spot at an early period. The old tower was taken down in 1748, and the present, crowned with a spire, erected on its scite. In 1779 the body of the church was taken down, being in a state of decay, and the present edifice raised in its stead. Besides these places of worship on the establishment, here are meeting-houses for the various classes of Dissenters; Presbyterians, Independents, Baptists, Methodists, and Quakers. The public buildings are numerous: the court-house, or town-hall, is a respectable stone building on the south side of the High-street, erected about 1730, at the expence of the corporation. The county-hall is a spacious and magnificent edifice, erected about 1776, by Mr. Hiorne, a native of Warwick. A plain but large stone building, adjoining the hall, has lately been erected by Mr. Hakewill, for the accommodation of the judges at the assizes. The county gaol adjoins the great hall, and is a large, substantial, and well-designed modern fabric, surrounded by a strong wall, twenty-three feet high, which incloses nearly an acre of ground. The county bridewell is also a spacious modern structure, of a very judicious character. The market-house is a substantial stone building: the lower and open part is appropriated to the use of those who attend the markets. Leicester Hospital is an ancient edifice, situated at the western extremity of the High-street, and was originally the hall belonging to two guilds which were founded in the time of Richard II., but were afterwards united. After the dissolution of this fraternity by Henry VIII., the building became the property of Robert Dudley, earl of Leicester, who, in the twenty-eighth of Elizabeth, converted it into an hospital for twelve poor men, and one master, a professor of divinity. The land with which it was endowed was at that time valued at 200*l. per annum;* but in 1811 the clear annual value amounted to nearly 2000*l.*, owing to the augmentation of the rents of land; and each of the pensioners received about 130*l.* from the surplus. In 1813 important changes were introduced by act of parliament, by which the number of pensioners was to be increased to twenty-two, with an allowance of 80*l. per annum* to each, and the salary of the master was to be progressively advanced to 400*l. per annum.* The appointment of the master and brethren is in the heir-general of the founder, who is, at this time, John Shelly Sidney, esq. of Penshurst-place, in the county of Kent. The buildings of the hospital consist of lodgings and a public kitchen for the brethren, ranged in a quadrangular form, a chapel, and a spacious hall, in which the guild is supposed to have held their meetings, but which is now converted into apartments for the ten additional brethren. Various charity-schools and alms-houses have been erected and endowed; and a new institution is now established for providing a refuge for juvenile delinquents, who are brought to the bar of justice at the several gaol-deliveries for the county; and for bringing them up (after the term of their imprisonment) in habits of industry and virtue. The estates and monies appropriated to charitable and public uses for the benefit of the town are also very considerable. In 1811 a subscription was commenced for paving the streets, and was supported with great spirit and liberality. All the principal streets have by this means been handsomely flagged; and the work has been completed (at the expence of about 6500*l.*) to the perfect satisfaction of the subscribers and the public in general. Warwick has a weekly market on Saturdays, which was formerly inconsiderable, but it is now large, well supplied, and numerously attended. Here are also twelve annual fairs; and horse-races take place twice in the year. Manufactures are established here to some extent, particularly those for worsted and cotton; and one of lace has been recently established from Nottingham. The civil government of the town is vested (under a charter granted by William and Mary, in 1694) in a mayor, a recorder, 12 aldermen, and 12 principal burgesses, with a town-clerk. It appears, from the rolls of parliament, that Warwick was represented as early as any of the boroughs. It returns two members, chosen by the inhabitants paying scot and lot, the mayor being the returning officer. But for many years past, one of the members has, by tacit agreement, been returned by what is called the independent interest, and the other by the Warwick family. According to the enumeration under the act of 1811, the population of Warwick was 6497; the number of houses 1283.

On the south-east of the town is *Warwick castle*, built on a rock, to which it seems united rather by the hand of nature than by human art. It is not known, with precision, at what period a castle was first built on this spot, but the foundation is supposed to have taken place by Ethelfleda, daughter of king Alfred, in the year 915: nothing, however, is thought to remain of this erection, except the mound of earth on which the keep, or dungeon, is supposed to have stood. From the period when William the Conqueror gave this fortress to his adherent Henry de Newburgh, whom he created earl of Warwick, it became of consequence in English history, and so continued during the union of its fortunes with those of the succeeding earls, through the lines of Beauchamp, Neville, Plantagenet, and Dudley. The latter family being extinct, James I. granted the castle with all its dependencies to sir Fulk Greville, afterwards lord Brooke. At his time it was in a ruinous condition, and the strongest part was used as the county gaol. This proprietor restored it, and, it is said, expended in repairs and embellishments the sum of 20,000*l.*; and in his family it has continued, without interruption, to the present time. During the civil wars of Charles I. it was converted (as before noticed) into a garrison for the parliament. In consequence it was besieged in 1642 by lord Northampton, who also surprised the artillery dispatched from London for its defence. Notwithstanding this misfortune, sir Edward Peto had the gallantry to defend it with a single piece of ordnance, until it was relieved by lord Brooke. In the time of Charles II. Robert lord Brooke greatly embellished the state apartments. Francis, his successor, was created earl Brooke of Warwick castle in 1746, and earl of Warwick in 1759. The whole castle consists of a connecting series of walls, towers, and other buildings, surrounding a large irregular court. At the south-east angle is Cæsar's Tower, the most ancient part of the whole. Of its exact date no trace however remains, but it is still in the most perfect state of strength and repair. Guy's Tower, at the north-east angle, is named after the legendary champion, and was erected in the reign of Richard II.: it is 128 feet in height. In the centre of the east front is the great arched gateway, leading into the inner court, flanked with towers, and succeeded by a second arched gateway, with other towers and battlements above it. Before this whole front is a moat, over which an arch is thrown, where the drawbridge formerly was. Passing the entrance tower, the display is truly magnificent. The area is clothed with verdure; but the mighty remains of ancient fortifications are spread around. The habitable part of this immense structure lies to the left of the great court; and in the progressive ameliorations of feature effected in latter ages, every desirable attention has been paid to consistency of character. The interior surpasses the expectation raised by the external view; for with the ponderous towers, and ramparts of stone, we associate only ideas

ideas of chivalric hardihood, and unpolished baronial pride. The grand suite of apartments extends in a right line 333 feet, and are furnished in a chaste but magnificent manner. They contain many fine and interesting pictures, and in a gallery is some curious armour, painted glass, and other ancient relics. The park attached to the castle is very extensive, and finely ornamented with wood and water. The gardens and pleasure-grounds are arranged with great taste; and a broad gravel-walk conducts to a green-house, a spacious building, erected purposely for the reception of a large antique vase, which is considered as one of the noblest specimens of ancient art now in England. It is of white marble, and is of a circular form, sufficiently capacious to hold 163 gallons: it is placed on a square pedestal, and is made to move round by means of a mortise and tenon. This exquisite antique was found (as a Latin inscription states) at the bottom of a lake, not far from Adrian's villa, near Tivoli, about twelve or fourteen miles from Rome: it was first purchased by the late sir William Hamilton, of whom it was bought by the late earl of Warwick, and conveyed to England at his expence. In Britton's "Architectural Antiquities," are two views of the castle, with a particular history and description of the edifice.

In the vicinity of Warwick, on the north, stood the Priory of St. Sepulchre, founded by Henry de Newburgh, earl of Warwick, in the reign of Henry I. It was designed for a society of regular canons, instituted in imitation of one of the same order, established at the holy sepulchre in Jerusalem. In the 38th of Henry VIII., the building and adjacent lands were granted to Thomas Hawkins, the son of a person who sold fish at the market-cross in Warwick. The ancient edifice was then pulled down, and the present eligible residence was erected.

About a mile and half from Warwick, on the north-east, is Guy's Cliff, an ancient hermitage, and traditionally said to be the retirement of the celebrated champion Guy of Warwick. It is now the seat of Bertie Greathead, esq. distinguished by his mental and moral qualities, to whom a tribute of respect is due by all who have the honour of his acquaintance. The capacious stables, cellars, and out-houses, are formed by excavations in the solid rock.

About half a mile from Guy's Cliff is Blacklow Hill, rendered memorable by the summary execution of Piers Gaveston, earl of Cornwall, the favourite of Edward II. in 1312, on this spot.

Myton, a short distance from Warwick, was formerly a considerable village, but in the time of Dugdale, "there was no more left than a grove of elms, in the place where the village stood." It has now one house, a modern structure, called Myton House.

At a small distance also from Warwick, on the Stratford road, is Longbridge House, the seat of William Staunton, esq.—Dugdale's History and Antiquities of Warwickshire. Beauties of England and Wales, vol. xv. Warwickshire. By J. N. Brewer, 1814.

WARWICK, a town of the state of Rhode island, in the county of Kent, containing 3757 inhabitants; 7 miles S. of Providence.—Also, a county of Virginia, containing 1835 inhabitants.—Also, a town of Virginia; 6 miles S. of Richmond.—Also, a town of Virginia, and capital of a county, established in 1628; 65 miles E.S.E. of Richmond. N. lat. 37° 8'. W. long. 76° 30'.—Also, a town of Massachusetts, in the county of Hampshire, containing 1227 inhabitants; 80 miles W. of Boston.—Also, a post-township of New York, in Orange county; 120 miles S. of Albany, and 10 miles E. of Goshen: its form is triangular; its area may be 110 square miles: the S. part is broken by ranges of hills, in which are several large ponds that run S. to the Passaic of New Jersey: the N. part, which is less broken, is watered by the Walkill and other streams that run N. to the Hudson, in Orange and Ulster counties. Few towns have a greater quantity of fruit, and the apple-orchards are very fine. Here are five places of worship and sixteen school-houses; nine grain-mills, ten saw-mills, six carding-machines, and sixteen distilleries of fruit-spirits. Here are a furnace, several forges, an anchor-shop, being the oldest in America, that of Rhode island excepted, and a steel-furnace. The village of Warwick, in which is the post-office, 11 miles E. of Goshen, has two houses of worship, and about thirty dwellings. Florida village is situated 4½ miles N. of Warwick: it has a church, an academy, and about thirty dwellings; and Amity in the W. has also a church. The whole population in 1810 was 3978, when there were 323 electors.—Also, a township of Pennsylvania, in the county of Bucks, containing 1287 inhabitants.—Also, a township of Pennsylvania, in Lancaster county, containing 3439 inhabitants.—Also, a post-town of Maryland, on the east shore of Chesapeak bay; 14 miles S. of Elkton.

WARWICK'S, *Earl of, Powder.* See *Scammony* POWDER.

WARWICKSHIRE, an inland county of England, is situated near the centre of the kingdom. In form it approaches to an oval; and is bounded on the S.E. by the counties of Oxford and Northampton; on the N.E. by the great Roman road termed Watling-street, which separates it from Leicestershire; on the N.W. it is limited by Staffordshire; the county of Worcester lies on the W.; and part of Gloucestershire on the S.W. The greatest length, from N. to S., is 51 miles; and the greatest breadth, from E. to W., is 36 miles; the circumference being about 150 miles. It forms an area of 984 square miles, or 639,760 acres; of which about 154,530 acres are in a constant course of tillage; 190,000 acres are arable, and 300,000 in pasturage.

Civil and Ecclesiastical Divisions: Population.—When Domesday-book was compiled, this county contained ten hundreds; a circumstance which seems to prove the consequence and great population of the district at that period. These hundreds did not exist long under the names mentioned in that roll; but though they fluctuated in title, the number for some time remained nearly the same. There are now only four hundreds; Barlichway, Hemlingford, Kineton, and Knightlow, which are subdivided for convenience into eighteen parts. The city and county of Coventry, though forming a district politically distinct from Warwickshire, is usually considered as a fifth hundred. Warwickshire, thus constituted, contains a half city, Coventry; one borough, Warwick; and eleven other market-towns, *viz.* Alcester, Atherstow, Birmingham, Coleshill, Henley, Kineton, Nuneaton, Rugby, Southam, Stratford-on-Avon, and Sutton-Colfield; together with part of the town of Tamworth. The whole county comprehends 193 parishes. According to the population return of the year 1811, the number of houses was 46,157, of inhabitants 228,735; *viz.* 109,539 males, and 119,196 females: 15,131 families were stated to be employed in agriculture, and 29,775 in trade and manufactures. Six members are returned to the imperial parliament; two for the shire, two for Coventry, and two for the town of Warwick. This county is comprised in the province of Canterbury, and in the dioceses of Lichfield and Coventry, and of Worcester; it is included in the Midland circuit.

Antient State: Historical Events.—Warwickshire was one of the five counties which, at the time of the Roman invasion, were possessed by the *Cornavii* or *Carnabii*. Mr. Whitaker,

Whitaker, in his "History of Manchester," observes, that these and the Britons of Cornwall in the south-western regions of the island, and those of Caithness in the north-eastern, are all equally termed Carnabii by Richard of Cirencester, who expressly declares that these people were originally situated in the neighbourhood of the Dee, and extended their possessions across the whole of Warwickshire, to Bennonæ, or Cleychester, on the skirts of the adjoining county of Leicester. Of the history of this district while under the Romans, but little can now be satisfactorily ascertained. In the year 50, Ostorius first visited the Arden of Warwickshire. He led his troops from the banks of the southern Ouse, taking in his northward progress the course of the Watling-street, and probably fixing his encampments on the scites of British stations. In order to increase his security, and to extend the line of military communication, he constructed forts and entrenched camps along the banks of the rivers Avon and Severn. As the woodland recesses of the district emphatically termed Arden, then comprised the greater part of Warwickshire, and were chiefly inhabited by the *Ceangi*, or herdsmen, Ostorius probably did not deem it expedient to fix any military station in the interior of the county on the north of the Avon. His great Ardenian station was assuredly *Tripontium* (Lilburn, Northamptonshire, on the border of this county). At High-Cross was a second settlement, now included in the county of Leicester. Further north, on the Watling-street, was *Manduessedum* (Manchester). The chain of camps on the Avon communicated with these places, and at Warwick, nearly in the centre of the line, some writers have placed the Præsidium of the Romans; but this still remains a subject of dispute among antiquaries. With greater certainty the honour of a Roman station may be ascribed to *Alcester*, on the Ickneild-street, in the south-west division of the county. The second journey of Antoninus passes through this part of England, from north to south; but as he adhered strictly to the track of the great street, when on the confines of Warwickshire, he only gives in his Itinerary the name of one station—Manduessedum. Cogidunus, who had been originally king of the Dobuni, was not only permitted by the Romans to retain nominal authority, or, in other words, to become an imperial legate, but had various extents of country added to his dominions. Among these was a part of Warwickshire; and he retained his titular supremacy to the days of Trajan. When Severus, in the beginning of the third century, divided the Roman territories in Britain into two provinces, the greater part of this county was comprehended in Britannia Secunda. During the period between the secession of the Romans and the conquest of the midland district of England by the Saxons, the silence of historians respecting this tract, induces us to suppose, that the inhabitants wisely avoided civil contention. Credda was the first Saxon commander who obtruded on this peaceful disposition of the natives. On the formation of the heptarchy, Warwickshire was constituted a part of the powerful kingdom of Mercia; and with this new political arrangement recommence those military details which form the grounds of ordinary history. The kings of Mercia often maintained the rude pomp of their court in this county. Tamworth was a favourite seat with several sovereigns, until that town was destroyed by the Danes. A charter of Burthwulf, king of Mercia, in the Textus Roffensis, is dated from Warwick: Kinsbury was also a regal abode. Among the numerous conflicts produced by the ambition of those fresh invaders, to which the country was now subject, the battle of Seckington is especially memorable. Here Ethelbald, the tenth king of Mercia, fought Cuthred, king of the West-Saxons, and was slain by Burgred, his own officer. The Danes committed great ravages in Warwickshire; and in the course of their several irruptions, burned and destroyed the principal towns. The war between the houses of York and Lancaster forms the next great historical era. During this calamitous period, the people of this county, in common with other districts, was much divided in sentiment, and lost some of its best blood in the field, though it was not the immediate scene of any important action. As the chief members of the house of Neville, of which the earl of Warwick was a distinguished branch, supported the pretensions of the duke of York, it will be supposed that his interest was strong in the county. But in those infuriate days, when even families were divided in motive, no citizen could depend on the integrity of a neighbour. The town of Warwick was swayed by its earl; but the city of Coventry had equally strong reasons for attachment to the house of Lancaster. Henry and Margaret had won the esteem of the inhabitants by frequent visits, and had conferred on them a particular favour, in constituting their city, and some adjacent parishes, a separate county. The citizens were firm in affection and gratitude. In 1460, when a strong power, under the earl of Warwick and the earl of March (afterwards Edward IV.), proceeded from London in search of the royal forces, the Lancastrians were quartered in Coventry. They shortly, however, quitted that city, and the battle of Northampton ensued. In 1470 the earl of Warwick, then a partisan of the Lancastrians, possessed himself of Coventry, and the citizens refused admission to Edward IV., who met with a more friendly reception in the town of Warwick. When Richard III. took arms to oppose the earl of Richmond, the sheriff of this county levied men for the king. But it is probable that they were not engaged in the decisive action, as it appears, from an inquisition then taken, that the sheriff (Richard Boughton) was slain two days before the battle of Bosworth; whence it is supposed, that marching to the aid of the king, he was encountered and overpowered by some of the earl's troops. In the 17th century, when the nation was again plunged into the miseries of civil contest, the inhabitants of Warwickshire evinced a greater unanimity of sentiment. Some were found ready to adventure life and fortune in support of their king; but these were few in number. The influence of lord Brooke, one of the earliest and most strenuous advocates of the popular faction, did much in kindling the zeal of the natives; and his local resources were of distinguished service to his party. The castle of Warwick, situated near the centre of the kingdom, and strong by nature and art, was a most convenient place of arms; and the possession of such a garrison gave confidence to the first hostile movements of the parliament. The flame of opposition spread through every town; and no county exhibited a more decided inclination to take an active part in the sanguinary business. In June and July 1642, lord Brooke arrayed the militia of the county, in attention to a commission received from the parliament; and, in October following, was fought the first great battle between the opposed parties at Edgehill, on the south-east border of this county. On this eventful day, lord Brooke's own regiment, composed of prime Warwickshire men, fought in the right wing, and entirely broke the left of the king's army. At different periods of this war, the castle of Warwick sustained a siege, the town of Birmingham was fired by the troops under prince Rupert, and many inferior skirmishes took place. Though only a comparatively small part of the population of England was actively engaged in these degrading hostilities, yet Warwickshire furnished its full

full quota to the parliamentary forces. During these scenes of violence, some religious structures, and numerous mansions of the gentry, suffered much dilapidation. After that complete destruction of the hopes of the Royalists, which followed the battle of Naseby, Warwickshire, among other midland counties, remained under the quiet controul of the parliament, until the entire restoration of national good order.

General Aspect, Soil, Produce.—Warwickshire is described by early writers as naturally divided into two parts, the Feldon (or Champaign) and the Woodland. The river Avon formed the line that separated these tracts; and the sylvan district was emphatically denominated *Arden*, which term is well known to have been common among the Celtæ in general for a forest however situated. The Arden of this county is asserted to have been the largest of the British forests, as it extended from the banks of the Avon to the Trent on the north, and to the Severn on the west; on the east the tract was bounded by an imaginary line drawn from High Cross to Burton. When England was divided into shires, the counties of Worcester and Stafford took their respective portions of this wild, and bestowed on the forests so claimed the names by which they are still distinguished; the part remaining within Warwickshire alone retained the title by which the whole was originally designated. But this large division has been long cleared of those thick-matted woods which formerly encumbered, rather than ornamented its soil. A colouring, however, of its pristine character remains; and an occasional air of wildness is found to denote the complexion of the country when occupied by the Ceangi or the Cornavii, and their numerous herds. In general aspect Warwickshire presents a face of country agreeably diversified by such an alternation of hill and valley as is equally gratifying to the eye of the pictorial traveller, and beneficial to the more important views of the agriculturist. The insulated situation of the county, and its freedom from any great inequalities of surface, render the climate mild, and vegetation early. The most general winds are from the south-west, and usually accompanied with rain. Warwickshire, upon the whole, however, is not to be considered as subject to any particular excess of damp or frost. The *soil*, as is usual in the midland district, possesses great variety. Nearly every species is to be seen, except that incorporated with chalk and flint; and often many of these varieties occur within one field or inclosure. The greater part of the soil is, however, of a description highly favourable to the purposes of agriculture; and it may safely be asserted that few counties possess less bad or steril land, in proportion to that which corresponds readily and abundantly with the husbandman's toil. The crops usually cultivated are wheat, barley, oats, peas, beans, vetches, and turnips. The crops partially raised, but which are not admitted into the ordinary rotation of farms, are rye, potatoes, and flax. The live stock reared by the grazing farmers is of various descriptions; but the long-horned cow is the sort chiefly bred in the county. The Warwickshire sheep of the large polled kind have been judiciously crossed with the Leicester; and a very serviceable breed has resulted. The farms of Warwickshire are in general far from large; but the system of consolidation appears to be rapidly growing into favour with the great landholders. At present about 150 acres are the average size of farms throughout the county. Few leases are granted; but the rent of land, with the exception of such districts as border on great commercial towns, is very moderate. The principal woodlands of this county are still to be found in the neighbourhood of its former great forest, in the middle, western, and northern districts; but nearly every division is interspersed with valuable and ornamental timber. Oak, matured and grand, conveying the story of former ages, yet likely to flourish in the days of succeeding generations, is attached to almost every residence of hereditary consequence. Elm, in the most flourishing condition, is also abundant. Nor does the county entirely depend for its wealth in woodland recesses on the liberal providence of past ages; the recent plantations are numerous and carefully attended. There are also many coppices, consisting of oak, ash, hazel, alder, birch, and beech. Concerning the management of these nothing peculiar occurs. They are cut in regular allotments, so as to admit of a fall in every year. As coals abound in this county, the wood is seldom consumed as fuel, but is used chiefly for hurdles, hoops, rails, &c.

Rivers, Springs, Canals.—Warwickshire is watered by numerous streams, which impart richness to large tracts of pasture, and add much to the pictorial charms of the county, though (with the exception of the Avon) they are of a character too trivial to bestow important facilities on commercial interchange. The principal are, the Avon, the Tame, the Leam, the Rea, the Stour, the Alne, the Arrow, the Anker, the Blythe, the Swift, the Cole, and the Dove. The Avon, (termed the Upper, or Warwickshire Avon,) the only one which claims particular notice, derives its source from a spring in the village of Naseby, Northamptonshire, and enters the county of Warwick at Bensford bridge; whence proceeding in a south-west direction, but with devious windings, it reaches the town of Warwick, through valleys which conspicuously increase in beauty. Passing close to Warwick castle, whose lofty towers so finely decorate its course, it expands in some places to the breadth of two hundred feet, as it pursues its track through the grounds attached to this princely residence. It now draws near to the neighbourhood which imparts classic immortality to its name. It passes Fulbroke, and taking a large sweep towards the north, washes the border of the celebrated town of Stratford. Hence it proceeds, with no deviation of interest, to Bidford, supposed to have been Shakspeare's retreat for convivial relaxation. At the distance of a mile from Bidford, near the village of Cleve, the river, though broad, is only four feet in depth. It shortly after leaves the county, having, in its progress through it, received the aid of several minor streams. The Avon was made navigable for vessels of forty tons burthen, from Stratford to its conflux with the Severn at Tewkesbury, in the year 1637; but the numerous canals which have since been formed have much diminished its traffic. The chief medicinal springs are those of Leamington and Newnham-Regis. The former are found so efficacious in many chronic disorders, in diseases of the skin, and visceral obstructions, that the village in which they rise is rapidly augmenting in buildings of a costly and ornamental character. The latter is a weak chalybeate, and a bath formed from its waters was once in great repute for the cure of scorbutic complaints; but it is now resorted to only by a few. The canals of the county are the great objects of consideration while treating of artificial water. Warwickshire is conspicuous for commercial enterprise, and for the spirit with which manufactures are cultivated. It will naturally be supposed that a people so industrious and intelligent have been active in profiting by the great medium of canal conveyance. No county, indeed, can boast of more numerous facilities of this description; and some diversions from original channels are yet projected, which a more propitious era may bring to perfection. The canals in this county are, the Birmingham Old Canal, the Birmingham and Fazely, the Warwick and Birmingham, the Worcester

ter and Birmingham, the Coventry, the Warwick and Napton, the Stratford, and the Afhby-de-la-Zouch Canal. (See their refpective names under the article CANAL.) While fo much liberality has been evinced in the extenfion and improvement of water conveyance, the chief roads of the county have been far from experiencing neglect. The materials principally ufed are lime-ftone and gravel; and with thefe the high turnpike ways are kept in good repair. This is a circumftance of public accommodation peremptorily required by the manufacturing intereft; but where the agriculturifts are left to their own exertions, we return to fuch rough and homely channels as were tedioufly trodden by the unambitious tenantry of paft centuries. The crofs-country roads are treated with too little attention in nearly every part of the county.

The minerals and foffils of Warwickfhire are, coal, lime-ftone, free-ftone, iron-ftone, blue flag-ftone, marle and blue clay. The beft coal in the county is that found at Bedworth. The feam at this place is from three to four feet in thicknefs. It fells at the pit for 12*s.* *per* ton. Lime-ftone abounds in many parts, and the lime fold at the kiln from 2*s.* 6*d.* to 3*s.* *per* quarter, or from 43*s.* to 45*s.* *per* waggon load. Free-ftone rock is found in moft divifions where the foil is a light fand; and confiderable quantities of blue flag-ftone are wrought in the vicinity of Bidford and Wilnecote. The weft part of the county is prolific of good marle; and blue clay abounds in the eaftern diftricts.

Manufactures of various defcriptions are carried on to a confiderable extent. The manufactory of hardware goods at Birmingham has obtained for that town the appellation of "the toyfhop of Europe," and is a juft fubject of national pride. Not lefs than 16,000 people, in the city of Coventry, and neighbouring towns and villages, are employed in the manufacture of ribbons. Watch-making is likewife carried on by numerous workmen in all its branches. Horn combs of all defcriptions are made at Kenilworth. At Warwick are manufactories of worfted for hofiery; of calicoes, and other cotton goods, from yarn fpun at Manchefter and its vicinities; and a mill for the fpinning of cotton yarn. At Alcefter about fix hundred perfons are employed in the making of needles; and in other parts of the county are confiderable flax manufactories, and much linen yarn fpun.

Antiquities.—The ftate of the county, while occupied by the Britons, and during the invafion and fettlement of the Romans, and their Saxon fucceffors, we have already noticed. It remains to mention the relics of thofe eras, the tangible memorials of days long paft. Although Mr. Shaw, in his hiftory of Staffordfhire, conjectures that the chief feat of the Arch-Druid of Britain was fituated in the vicinity of Sutton-Colfield, yet we find few veftiges that can be fafely afcribed to the Britons. The Romans, warlike, fuccefsful, and vaft in undertaking, worked for pofterity; and their connection with Warwickfhire would be obvious, if every other record had funk amidft the wrecks of time. The *roads*, which at once facilitated conqueft, and aided the progrefs of civilization, form the moft interefting relics of this great people. The *Watling-ftreet*, that moft ftupendous of their works in Britain, divides this county from Leicefterfhire on the north-eaft. From Weedon to Lilburn it is only a private road, though diftinctly marked, and well known. It then forms the public way between Daventry and Lutterworth, when it again becomes private, and fo continues till it reaches High-Crofs. Here the turnpike-road from Lutterworth to Atherftone paffes over it. Beyond Atherftone it is in good repair, and fhortly becomes the bafis of the great Chefter road. The *Fofs-way* interfects the Watling-ftreet at High-Crofs. Paffing near Monk's Kirby and Stretton, it goes through Brinklow, Bretford on the river Avon, and Stretton-upon-Dunfmoor; then croffing the river Leam, near Stretton-on-Fofs, it enters Gloucefterfhire. This road, which is fuppofed to have been conftructed in the third confulfhip of Hadrian, nearly 1700 years back, is ftill firm through many parts of its progrefs, and likely to mock the affaults of time for centuries. A third Roman way, connected with Warwickfhire, is the *Icknield* (or, as termed by fome modern writers, *Ryknild*) *ftreet*. It enters on the fouth, and is clearly diftinguifhable in the neighbourhood of Bidford. Between Wixford and Alcefter few traces remain; but to the north of the latter place, it again rifes to notice, and is known by the name of the *Haden-way*. After paffing Studley, it enters a recefs of Worcefterfhire, and returns in the vicinity of Birmingham. Touching the margin of Staffordfhire, it proceeds to Sutton-Park, where it is to be diftinctly traced. A minor road, termed the *Ridgeway*, likewife borders Warwickfhire on the eaft; and feveral branches appear to have diverged from each of the great tracts. The principal ftations of the Romans in this county have been already mentioned. The remains of various camps conftructed by that people are found in different ftates of prefervation. The chief of thefe are feen on the Fofs-way, where places of accommodation were formed for the troops on their marches; and on the banks of the Avon, where Oftorius arranged a chain of minor fortifications to keep the natives in awe. Many tumuli are found in the vicinity of the roads and camps, and coins and other veftiges of the Romans have been difcovered in almoft every diftrict. Here are few military remains of the Saxons, or of the Danes; and the relics of Saxon architecture are far from numerous, and are by no means confpicuous for the rude but commanding grandeur of effect fometimes produced by that people. This county contains many inftances of fine caftellated and ancient domeftic architecture; and manfions of more recent erection are frequent, and in a highly creditable tafte. Few religious edifices will be found remarkably confpicuous either for magnitude or beauty, with the exception of thofe of Coventry, St. Mary's, Warwick, with its attached chapel, and the church of Stratford.—Dugdale's Hiftory and Antiquities of Warwickfhire. Beauties of England and Wales, vol. xv. Warwickfhire, by J. N. Brewer, 1814.

WARY. See CARLSBAD.

WASA, or VASA, a fea-port of Sweden, and capital of a government to which it gives name, built by Charles IX. This government comprehends all the fouthern part of Eaft Bothnia; 50 miles N. of Abo. N. lat. 63° 5'. E. long. 21° 29'.

WASANGO, a town of Africa, in Whidah; 5 miles E. of Sabi.

WASASHE, or OSAGES (which fee), a people of Louifiana, who are divided, according to Mr. Brackenridge (Views of Louifiana, 8vo. 1814), into three bands: the Great Ofage, the Little Ofage, and the band of Big Track, from a chief who left the nation fome years ago, and is now fettled on the Arkanfas. Their language may be confidered as the primitive of feveral others, which are fpoken by neighbouring nations, without any great difference; as the Arkanfas, Kanfas, and Mahas. They trade principally in deer-fkins, bear-fkins, beaver, otter, mufk-rat, and the buffalo. Thefe people are noted for their uncommon ftature, which has fometimes been exaggerated. They are reputed warlike, though not poffeffing any uncommon degree of bravery. When compared with the Shawanofe, and the nations weft of the Miffiffippi, they might with greater propriety be regarded as a treacherous and

and cowardly race. The Osages have their villages on the Missouri. The Kansas were, a few years ago, the most abandoned tribe of the Missouri, robbing traders and all trading whites; but of late, in consequence of a severe defeat from the Panis, in which their greatest warriors fell, they have been humbled. They are brave, and are esteemed great warriors. They have their villages on the Kansas river. Their country abounds with the beaver, but they do not hunt much. They speak the Osage language with some difference of dialect. The *Mahas*, or Oo-ma-ha, reside on the Maha creek, about 80 leagues above the latter, in some villages, and raise corn. They are a friendly and industrious people, and have a considerable trade. Their language is that of the Osages. All the Sioux bands, except the Yanksons, make war upon them. Their numbers have been lately much reduced.

WASEN. See Wesen.

Wasen, a town of Austria; 8 miles S.S.W. of St. Polten.

WASERHITEN, a town of the duchy of Carinthia; 2 miles N.W. of Eberndorff.

WASH, the distiller's name for the fermentable liquor, made by dissolving the proper subject for fermentation and distillation in common water.

The wash of the malt-distiller is made by mixing the water hot with the malt ground into meal. If the water be too hot, the mixture will become gluey; and if too cool, a part of the virtue of the malt will be lost. Under the right application of the water is to be considered the proper manner of agitating the mass, so that all the parts of the aqueous fluid may come fully and freely in contact with the soluble particles of the subject. When once the water is well saturated by standing on the malt a proper time, it may be drawn off, and fresh poured on, till at length the whole virtue, or all the sugary sweetness of the malt is extracted, and nothing but a fixed husky matter remains behind, incapable of being farther dissolved by the action of hot or boiling water, or of being advantageously washed or rinsed out by the bare affusion of cold. This artificial and external agitation, or stirring about of the mass, is necessary not only in the common way of brewing for the malt-distillery, but also in that more expeditious way, now in use with some, of reducing the operations of brewing and fermenting to one, and grinding the malt to a fine meal, which is to be kept in the wash during the whole time, and even put into the still with it, and worked together. The stirring may be repeated to great advantage more than once in each operation, as at the affusion of every parcel of fresh water, in the common way, and at any shortly distant times in the short way, in which it is of greater service.

The difference of seasons is found to require some alteration in the direction and management of the business of brewing for the malt-distillery. The water must always be used colder in summer than in winter, and the tincture must be cooled suddenly in close sultry weather, to prevent it from becoming eager or sour. The summer season also gives malt an over-forward disposition to ferment, and this impairs the quantity of spirit, and is to be checked by the addition of a quantity of unmalted meal, which, being less disposed to ferment than the malted meal, will restrain and moderate its impetuosity. The action of fermentation works such a change in the body of the tincture or solution, called the wash, as to render it separable by the action of fire, into parcels of matter that are specifically different, and of a nature entirely foreign to what the same liquor would have yielded without the fermentation. With respect to the proper workings of this liquor, great regard is to be had to the containing vessel. Its purity, and the provision for its occasional closeness, are the things to be principally considered. Though it is necessary that the vessel be perfectly clean, yet in the cleansing of it great care must be taken that no soap, or other unctuous body, be used, for this would check the fermentation in it; and for the same reason, all strong alkaline lixiviums are to be avoided. Lime-water, or even the turbid solution of quick-lime, however, may be safely used for this purpose; and this is, indeed, particularly proper to destroy a prevailing acid, which is very apt to be generated about the sides and bottoms of those vessels, if the warm air has access to them, and thus prevents the order of the fermentation.

It is a very prejudicial mistake, in the business of fermenting the wash, to suppose that the free concourse or admission of the external air is necessary to the operation. The contrary is the truth, and a great advantage will be found in practising upon this supposition. A constant influx of the open air, if it does not carry off some part of the already-formed spirit; yet certainly catches up and dissipates the fine subtle oleaginous and saline particles, of which the spirit is formed, and thus considerably lessens the quantity to be procured. This inconvenience is wholly avoided by the way of close fermentation, by which all air, except that which is contained in the vessel, is kept out.

This method of close fermentation is practicable to good advantage in the small way of business; but it requires such a considerable time, that it will never be liked by the large dealers, who are in a manner forced to admit the free air, and thus sustain a very considerable loss in the spirit, only to get the operation over in a proper time. Excepting for the necessity of expedition of this kind among the large dealers, it is certain that this slow and imperceptible vinous fermentation is greatly preferable, on all accounts, to the other.

The operation is known to be over in this close way of fermentation, as soon as the hissing noise ceases, and can no longer be heard on applying the ear to the vessel; and when, on opening it, the liquor is found to be clear, and of a vinous pungent taste; when it is arrived at this state, it should be set by for a time in a cooler place than that in which it was fermented; in this manner it will thoroughly purge itself of its lees, and will become perfectly clear, vinous, and pungent; in this state it should be drawn clear off from the lees, and immediately committed to the still; and by this method a perfectly pure vinous spirit will be procured, much better than that which can be obtained by the common way, which those who work large quantities fall into for the sake of expedition.

The particular intention of the operator may render various other additions necessary; thus some, to dispose the wash to yield more spirit, or to give the spirit a greater degree of pungency and a better flavour, add to it the strong and pungent aromatics; the cheapest chosen for this purpose, and the most used, are the cortex Winteranus, ginger, and grains of paradise.

In the common way, these additions, however, do very little, though, by a proper artifice in the management, they may be made of considerable use. Upon this foundation stands a very instructive method, used abroad, of making geneva *ab origine*, by mixing the bruised juniper-berries among the malt, and brewing the whole together; by this means a compound tincture, or wash, is prepared, which, by fermentation and distillation, affords a spirit much more intimately and homogeneously impregnated with the essence

effence of the berry than that prepared by our diftillers, in the common way of adding the berry to the malt-fpirit, and diftilling it from them again.

Wafh, being of a mucilaginous or fomewhat glutinous nature, requires management to prevent its fcorching, and make it work kindly in the ftill: if it fhould happen to be burnt in the operation, the fpirit will have a moft difagreeable flavour, and fuch as can never be got off again, without very great labour, and a particular treatment not known to every body. To prevent this ill effect, there muft be three things obferved; the liquor, or wafh, muft be made dilute, the fire muft be well regulated, and the whole kept in a conftant agitation. The manner of making the wafh dilute has been long known among the more judicious diftillers in this branch, and they have always found their fpirit the purer for it. The fire is eafily kept regular, by a conftant attendance, and avoiding hafty ftirring it, or throwing on new fuel; and the ftirring of the liquor in the ftill is to be effected by means of a paddle, or bar kept in the liquor, till it juft begins to boil, which is the time for luting on the head; and after which there is no great danger, but from the improper management of the fire: this is the common way, but it is hard to hit the exact time when to lute down the head; and the doing it either too foon, or too late, is attended with great inconvenience, fo that many have found out the other methods, of either putting fome moveable folid bodies into the ftill with the wafh, or placing fome proper matter at the bottom and fides of the ftill, which are the places where the fire acts ftrongeft.

There is another inconvenience attending the diftilling of malt-fpirit, which is, when all the bottoms, or grofs mealy feculence, are put into the ftill along with the liquor, the thinner part of the wafh going off in form of fpirit, the mealy mafs grows by degrees more and more ftiff, fo as to fcorch towards the latter part of the operation. The method ufed to remedy this, is to have a pipe with a ftop-cock, leading from the upper part of the worm-tub into the ftill; fo that, upon a half or quarter turn, it may continually fupply a little ftream of hot-water in the fame proportion as the fpirit runs off, by which means the fear of fcorching is taken away, and the operation at the fame time not at all retarded. In Holland, the malt-diftillers work all their wafh thick, with the whole body of the meal among it; yet they are fo careful in the keeping of their ftills clean, and fo regular and nice in the management of their fires, that, though they ufe no artifice at all on this head, only to charge the ftill while it is hot and moift, they very rarely have the misfortune to fcorch, except now and then in the depth of winter. When fuch an accident has once happened in a ftill, they are extremely folicitous and careful to fcrape, fcrub, and fcour off the remains of the burnt matter, otherwife they find the fame accident very liable to happen again in the fame place. But beyond all the other methods in ufe on this occafion, would be the working the ftills not by a dry heat, but in a balneum Mariæ, which might poffibly be fo contrived by the bafon being large, and capable of working a great many ftills at once, as to be extremely worth the proprietor's while in all refpects. Shaw's Effay on Diftillery. See FERMENTATION, and MALT-*Diftillery*.

WASH is alfo ufed for the fhallow part of a river, or arm of the fea, as the wafhes in Lincolnfhire.

WASH, the blade of an oar, or the thin broad part that is preffed againft the water in rowing. See OAR.

WASH-*Board*, in a *Ship*, a broad thin plank, fixed occafionally on the top of a boat's fide, fo as to extend the height thereof, and be removed at pleafure. It is ufed to prevent the fea from breaking into the veffel, particularly when the furface is rough, as in tempeftuous weather. Falconer.

WASH, in *Painting*. See WASHING.

WASH-*Lime, for boarding, walls, &c.*, in *Rural Economy*, that ufed for covering and preferving fuch works. An excellent wafh for this ufe is faid to be prepared by putting into a tub of fix or eight gallons fize a quantity of water fufficient to half fill the fame; and then adding thereto of clean fharp fand, and of lime *frefh* burnt, in about equal quantities, as much as will make, when well-ftirred up and mixed, a wafh of moderate confiftence. By means of this wafh, as foon as it is made, the boarding and walls, &c. of any barns or buildings, are to be paffed or laid over, keeping the fand conftantly well ftirred up, fo that the brufh may take it up as well as the lime. As the quantity of the wafh in the tub decreafes, more fand and more lime are, by degrees, to be added in fmall proportions, being careful to make up no more wafh at one time than will be immediately made ufe of by the workman. The quicker or the more frefh the lime the better, which, if good and proper for the purpofe, will make the wafh hot; and if it be required to make the wafh particularly hard and durable, it will be the beft and moft certainly effected by making ufe of boiling water inftead of fuch as is cold, taking care to make it only in fuch quantity that it can be laid on the boards while hot.

This wafh is cheap, and of admirable ufe, it is faid, in many cafes of boarding, faving the heavy charge of painting with oil paint.

WASH, in *Agriculture*, the refufe liquid which is formed and left in many ways and cafes; and alfo that which remains after the diftillation of grain for fpirit. The former, as well as the latter forts, are much ufed as the food of fwine, whence they are frequently called hog-wafh. The wafh of the diftilleries has likewife been lately found very beneficial and advantageous in the fattening of neat cattle. See HOG, STALL-*Feeding*, and SWINE.

Any of thefe liquid matters, when thickened a little with fome fort of mealy fubftance, form good fattening food for young hogs. See HAY, TEA, and SOUP.

Hard, dry, cut fodder, of fome kind or other, fhould conftantly too be ufed with the laft fort of wafh.

WASH *for rough-caft Stone and Wall-Buildings*, in *Rural Economy*, that which is ufed for preferving and rendering them more durable and handfome. It is faid that a highly protecting and ornamental wafh for thefe purpofes is formed and prepared by mixing well together four parts of powdered lime, three of good fharp fand, two of powdered wood-afhes, and one of the drofly refufe matter left in the making of iron; making them into a fufficiently fluid ftate, fo that they may be applied by means of a proper brufh. The appearance which is thus afforded to fuch buildings, when they become dry, is that of new Portland ftone, and they render the penetrating effects of wet and moifture of little or no difadvantage from whatever quarter they may come.

It may be noticed, too, that great benefit in the way of durability and ornament may be produced in fuch cafes by the cornices, window-foles, door-frames, and other fuch parts being fanded. The method of doing which is, by firft painting them with thickifh white paint, and then immediately dafhing them with fharp white fea or other fand, by means of a fort of dredging-box: the effect is, it is faid, that of an exceedingly good imitation of *ftone*. In this way

way they last nearly double the length of time they do in ordinary cases where sand is not employed.

WASH-*Off*, *To*, a technical expression used in *Calico Printing*, which denotes the soaking and rinsing of printed pieces in water, in order to dissolve and remove any gum or paste that had been employed with the colours in printing them. For want of this operation, the printed pieces will neither endure the rays of the sun nor moisture. The first shower of rain to which they may be exposed will not fail to wash out the pattern, and reduce them to a worse state than that of plain white calicoes. Parkes's Ess. vol. ii.

WASH-A-CUM-MOW, or CLEARWATER *River*, in *Geography*, a river of North America, which runs into the Athapescow lake, N. lat. 56° 36′. W. long. 110° 40′.

WASHBROOK, a river of England, which runs into the Wharf, near Otley in Yorkshire.

WASHEDEMOIAC, a river of New Brunswick, which runs into the St. John, N. lat. 45° 47′. W. long. 66° 6′.

WASHER, in *Rural Economy*, the name of a thin, flat, circular ring, or piece of iron, which is put upon the end of the axle-tree of a cart, waggon, or carriage of any kind, between the linch-pin and the small end of the nave of the wheel, in order to diminish the friction against the nave, to keep the wheel from having too much play, and to prevent the nave from rubbing against the linch-pin, so as to wear away too much. It is a term which is also applied to the thin rings and small pieces of iron that are used for many other purposes, as in the hanging of gates and many other such operations.

WASHES, *The*, in *Geography*, lands on the coast of England, between the counties of Norfolk and Lincoln, which are passable at low water, but overflowed by every tide, called by Ptolemy, *Æstuarium Metaris*. They are dangerous to strangers, who are unacquainted with the quick-sands. The parts which run into the land have particular names; below Spalding it is called Fosdike Wash; below Wisbeach, at the mouth of the Nen, the immediate boundary between the two counties, it is called Cross-Keys Wash.

WASHILABO, a river of the island of St. Vincent's which runs into Cumberland bay.

WASHING. See ABLUTION, LOTION, &c.

Washing the feet was a common piece of civility among the Jews, practised in regard to strangers, visitors, &c. at their arrival.

Washing the feet of twelve poor people, is an anniversary ceremony to be performed both by the kings of England and France; in commemoration of our Saviour's washing the feet of his apostles. See MAUNDY.

Arnobius, Adv. Gentes, lib. vii., mentions a feast in use among the ancients, called *lavatio matris Deum*. See LAVATION.

WASHING *of Ores*. See *Dressing of* ORES.

WASHING *of a Ship*, in *Sea Language*, is when all the guns are brought to one side; and the men getting upon the yards, wash her other side, and scrape her as far as they can reach.

WASHING, in *Painting*, is when a design drawn with a pen or crayon has some one colour laid over it with a pencil; as Indian ink, bistre, or the like; to make it appear the more natural, by adding the shadows of prominences, apertures, &c. and by imitating the particular matters of which the thing is supposed to consist.

Thus they wash with a pale red, to imitate brick and tile; with a pale Indian blue, to imitate water and slate; with green, for trees and meadows; with saffron or French berries for gold and brass; and with several colours, for marbles.

These washes are usually given in equal teints, or degrees, throughout; which are afterwards brought down, and softened over the lights with fair water, and strengthened with deeper colours for the shadows.

The colours which require only to be dissolved in water, are, for red, red ink; for blue, litmus; for green, sap-green and verdigrise in vinegar; for yellow, gamboge, the yellow berry wash and turmeric wash; for purple, the logwood wash and archil; for brown, Spanish liquorice; and for black, Indian ink.

The yellow-berry wash, which is a solution of the gum of the French berries in water, may be prepared by putting a pound of the French berries in a gallon of water, with half an ounce of alum; boiling them an hour in a pewter vessel, and then filtering off the fluid through flannel or paper. Put them again into the boiler, and evaporate the fluid till the colour appear of the strength desired; or part may be taken out while less strong, and the rest evaporated to a proper body. The turmeric wash is the gum of the turmeric root dissolved in water; it has much the same qualities with the former, except that it is a brighter and cooler yellow; but in order to procure a bright tincture, it must be dissolved in spirit of wine instead of water. For this purpose add 2 oz. of proof spirit to 1 oz. of water, and having put them into a proper phial, add 2 drachms of turmeric root in powder. Shake them well together, and let them stand three or four days, repeating the shaking as soon as convenient, and thus a strong tincture will be obtained Tincture of saffron is used as a yellow wash with water-colours. This is made by pouring hot water on the best English saffron in a proper phial or other vessel, which should be placed for some time in a heat next to that which would make the water boil, and the tincture should then be filtered through a piece of linen cloth. This tincture is a fine warm yellow; and when very strong, makes a very proper shade for the gamboge or other light yellows that are bright, and it will stand equally well any of the vegetable tinctures.

The zedoary wash may be prepared by boiling one ounce of zedoary root in a quart of water, till the water appears sufficiently tinged to make a stain on paper, of a full yellow colour; and then the fluid must be strained through linen, to free it from the dregs. This wash will be a stronger colour than can be made of turmeric without spirit of wine, and it is a cooler yellow than saffron, though full as bright. It is valuable for many purposes in painting with water-colours, as flowers, yellow draperies, &c. It may be dried in shells, and will afterwards dissolve and spread kindly, with the addition of water.

The colouring of maps, or other prints, is performed, either by spreading opaque colours so thinly on the subject, that the full effect of the printing may appear under them; or by using transparent colours, which stain the ground, and dry away, without leaving any opaque body, which last method is called *washing*. In employing the opaque or semi-transparent colours, care should be taken that no parts be so strongly covered with them as to prevent the distinct appearance of the shades of the printed design; as they are to shew themselves through the colours, and form the shades of the picture made by the colouring.

M. Cochin, in order to produce washed prints much more beautiful than the common, proposes to print upon the colours, instead of applying the colours upon the impression, in the following manner:

Having a plate already engraved, with a figure, in which it is required to introduce two or three colours, as the hat grey,

grey, the hair brownish, the cloak red, the coat and the stockings of different colours; let another plate of well polished copper be procured, and fitted to the size of the first: when this ungraved plate is varnished with white varnish, let a proof fresh drawn from the engraved plate be laid upon it, exactly in the place where the engraved plate has made the impression, and then spread two blankets upon the table of the press, and lay the varnished plate upon them, with the proof lying upon it; and having covered them with two or three other blankets, pass them under the roller of the press. When the blankets and proof are taken off the plate, the white varnish will have the same impression with that of the proof, in the manner of a counter-proof; and the outlines of the hat, hair, cloak, &c. must be traced with a very fine needle, and the plate then gently corroded. After this, the varnish should be taken off the plate; and some proofs should be taken from it on strong paper allumed, or upon cartoon, very thin and well beaten; which should be previously moistened, by lying in a damp cellar for a night, or two, or by putting it among the paper moistened in order to be printed. The proofs being made, and the cartoons or paper on which they were printed being dry, the part enclosed in the outline of the cloak should be coloured with a red ground; that within those of the head with a brown ground of bistre, and the same of the rest. The sheet thus coloured must then be put into the cellar, in order to moisten it; and having spread some of the blankets on the table of the press, the coloured sheet must be laid upon them, with the blank side downwards. After having inked all the first plate, that has the entire engraving upon it, in the manner for printing at other times, it must be put upon this leaf with the engraved side downwards, so that the parts of which the outline is marked on the sheet, may exactly coincide with those corresponding to them in the plate; and then two or three blankets being laid over them, the whole must be passed through the rollers. After which, the sheet being uncovered, will be found printed upon the colours, in a manner that renders the effect much more beautiful than that of those printed and coloured upon the printing, as in the common way. Handmaid to the Arts, vol. ii. p. 212, &c.

Washing *Colours*, a denomination given to such colours as are transparent in water; in contradistinction from those called *glazing colours*, which are pigments possessing the property of becoming transparent in oil.

Washing *over of Colours*. The washing or cleansing of some colours may be thus performed:—Take the colours to be washed, and put them, after having been well levigated or pounded, into a vessel of fair water; stir it about till the water be all coloured with it, and if any filth swim on the top of the water, scum it clean off, and when you think the grossest part of the colour is settled at the bottom, then pour off that water into another earthen vessel, that may contain the first vessel full of water four or five times; then pour more water into the first vessel, and stir the remaining colour till the water be thick, and after it is a little settled, pour that water also into the second vessel. Let this be repeated till all the finest of the colour is drawn off, and nothing but coarse gritty stuff remains behind. Then letting the water in the second vessel stand to settle, till it is perfectly clear, pour it off, and reserve the washed colour in the bottom of the vessel for use.

The colours to be thus washed are red-lead, blue and green bice, verditer, blue and green smalt, Spanish brown, yellow ochre, &c.

Washings, or *Washes*, among *Goldsmiths*, *Coiners*, &c. are the lotions by which they recover the particles of gold and silver out of the sweep, *i. e.* ashes, earths, sweepings, &c.

This is either performed by simply washing them again and again, or by putting them in the washing-mill.

To make one of these washes, they not only gather together the ashes of the furnaces, and sweepings of the work-houses; but they also break and pound the old earthen crucibles, and the very bricks of which the furnaces are built; little particles of gold, &c. being found to stick to them, by the flying off natural to those metals, when in their last degree of heat.

These matters being well ground, and mixed together, are put in large wooden basons, where they are washed several times, and in several waters, which run off, by inclination, into troughs underneath; carrying with them the earth, and the insensible particles of the metals, and only leaving behind them the larger and more considerable ones, which are visible to the eye, and are finally taken out with the hand without more trouble.

To get out the finer parts, gone off with the earth, they use quicksilver, and a washing-mill. This mill consists of a large wooden trough, at bottom of which are two metalline parts, serving as mill-stones; the lower being convex, and the upper, which is in form of a cross, concave.

At the top is a winch, placed horizontally, which turns the upper piece round; and at bottom is a bung, to let out the water and earth, when sufficiently ground.

To have a wash, then, the trough is filled with common water; into which they cast thirty or forty pounds of quicksilver, and two or three gallons of the matter remaining from the first lotion. Then turning the winch, they give motion to the upper mill-stone; which grinding the matter and the quicksilver violently together, the particles of gold and silver become the more easily amalgated with it; this work they continue for two hours: when opening the bung, the water and earth runs out, and a fresh quantity is put in.

The earths are usually thus passed through the mill three times; and the same quantity of mercury usually serves all the three times. When there is nothing left in the mill but the mercury, united with the gold and silver which it has amalgated, they take it out, and washing it in divers waters, they put it in a ticken bag, and lay it in a press, to squeeze out the water, and the loose quicksilver: the remaining quicksilver they evaporate by fire, in a retort, or an alembic. And the metal which remains they refine with lead, or part it with aqua fortis.

Washing *Fruit-Trees and Plants*, in *Gardening*, the practice of cleaning and removing insects and diseases from them by such means. It is well known that these sorts of trees and plants are very liable to be infested and injured in these ways by many different kinds of insects, and the diseases which are produced by them, as well as in other ways. It has been found greatly useful in destroying and removing the blue insect, the coccus, and the pine-bug, as well as in curing and clearing the trees of the mildew, honeydew, and some other such affections. The blue insect that breeds on the bark of different sorts of wall-trees has been beneficially treated in some cases by simply washing the trees with stale chamber ley, by means of a garden-engine, they being unnailed for the purpose. This has been done in so severe a frost, it is said, that the liquid was soon converted into ice upon the branches, with much seeming advantage. It does not appear, however, that the applying of the liquor in the time of hard frost is absolutely necessary to the success of the method; as trees washed in fresh weather are equally cleaned and cleared by the use of it. When on apple-trees, the brushing and washing with a mixture formed by soft-soap,

foap, fulphur, and the juice of tobacco, in the quantity of about one pound each to eight pints of foft water, has been ufed alfo with benefit. They are to be well mixed together, and fhaken well when made ufe of, being applied all over the trees. The infects will be ftill more completely removed, it is faid, if the earth about the roots of the trees be opened, and fome of the liquid poured in, the earth being clofed after a little time, as they are found to lodge much about the roots of fuch trees. It is fuppofed that fummer is the moft proper time for this operation, as the juices of the trees are then in motion, and appear to be much more eafily acted upon, than when they are in a dormant ftate. If trees fhould chance to be got which are fufpicious, it would, it is thought, be worth while to wafh them all over, and foak their roots fome length of time in the above mixture, before planting of them in the places where they are intended to ftand and grow.

In the removal of the coccus, and fome other infects, from old peach-trees, great advantage has occafionally been found from wafhing them well, after being brufhed and cleaned with ftrong foap-fuds, by means of a fponge dipped in them; and then applying the following compofition in a liquid ftate, or in that of a fort of paint: two pounds of the flowers of fulphur, and the fame quantity of foft-foap, well mixed together with as much boiling water as is fufficient to make the whole of the confiftence of a paint. The trees are to be payed over with this liquid fubftance, fo as not to mifs any part of them, whether old wood or new. And it fhould be fuffered to remain on the trees as long as poffible, that it may act the more fully, and in the moft perfect manner. It may be applied on the trees at any feafon of the year, but they are probably the moft conveniently dreffed in this way in the winter months. It is fometimes neceffary to repeat the dreffing for feveral feafons.

The wounds in peach, and other kinds of ftone fruit-trees, are likewife faid to be effectually prevented from cankering, by being laid over with the fame compofition, and then coated over with tar.

Brufhing over peach and nectarine trees alone, is faid in fome cafes too, to be effectual in removing infects from them.

The black infect that attacks the young top-fhoots of cherry-trees is faid to be effectually deftroyed by burning the compofition directed below, in fmall pieces, the fize of common eggs, under the trees with damp ftraw, the fmoke being made to pafs as much as poffible where the infects are the moft numerous: and foon afterwards wafhing the trees, where the ftate of the fruit will admit of it, well by means of the garden-engine, fo as to clear away fuch vermin, and prevent others fpreading themfelves on the trees: pitch any quantity with a fixteenth part of powdered orpiment, and the fame proportion of fulphur, diffolved over a flow fire in an earthen pipkin, until they be well incorporated and mixed together.

In the deftruction and prevention of the pine-bug, the method of wafhing and foaking that is given below has been found very effectual. A fmall brufh is firft prepared with bafs-mat, tied on a fmall ftock, which is that at the other end, in order to go down to the under end of the leaves where the bugs harbour moft. Then with the brufh and water they are to be wafhed and cleaned very well, after which one pound of the flowers of fulphur is to be put into a common garden-pan full of water; but if a little more, there is no danger of hurting the plants: the pine-plants are to be put into this liquid, and let remain for twenty-four hours; taking care that they are all covered, which may be done beft by putting a piece of board over them, with a fmall weight upon it: when they have been immerfed the above length of time, they are to be taken out, and fet on end with their tops downwards, in which way they are to ftand until quite dry; when they are to be potted in the ufual manner, and put feparate.

It is not neceffary that as much fulphur-liquid fhould be made up at once as may be fufficient to drefs and cure the whole ftock of plants; but that as one quantity of plants are finifhed and come out, it may be prepared, and another put in. It has not, however, been found to lofe the effect from ftanding. If made up and ufed as the plants become ready at different times, no defect will be found in the cure of the plants. But when made ufe of in the winter feafon, it will be advifable to take the chill off the water, and to keep it in a ftove; when convenient to be done in the fummer time, the plants will, however, take growth fooner and better. It is not thought advifable to apply the cure to fruiting plants; as by fhaking off the earth from their roots, and otherwife going through the operation, the fruiting would be injured too much.

The mildew on peach-trees may be kept under, though perhaps not wholly cured, by wafhing fuch as are affected with a mixture of fulphur and lime-water. The mode of applying it is by the garden-engine, with a little foap, or any other matter that may tend to feparate it from the trees: this mode cleans them at the time, but it does not prevent the recurrence of the difeafe. The difeafe has been fuccefsfully prevented, too, it is faid, by picking off the difeafed leaves as they appeared; and the points of any fhoots affected being dipped in water in which black foap was diffolved, they being afterwards well dredged by means of a bellows-pluff, filled with fulphur, and occafionally mixed with Scotch fnuff. This work is to be performed in the evening, and the matters wafhed off with the engine or fquirt and water in the enfuing evening, if the ftate of the trees, in refpect to flowering or ripe fruit, do not forbid it. But the difeafe is to be ftrictly watched and checked in its firft appearance.

The green and blue flies that appear, efpecially on plum-trees, a few days after the honeydew comes on, may often be got rid of by wafhing and watering the trees two or three times a week, in a perfect and plentiful manner, when the weather is dry; and while this dew continues upon the trees, adding a little common falt, and a quantity of the decoction of common broom to the water. This mixture, it is faid, effectually kills the flies, without injuring the trees, provided that too great a quantity of falt be not added. It is beneficial, too, in preventing the breeding of fuch infects.

There are many other cafes, in which wafhing with fuch mixtures may be ufeful. See the Scotch Horticultural Memoirs.

WASHING *Seed-Wheat*, in *Agriculture*, a term often applied to the practice of rendering it clean for fale, and fowing by the ufe of pure water, or fuch as is impregnated with different fubftances of various kinds. See STEEPING-*Seed*, SWIMMING, &c.

WASHING *Sheep*, in *Agriculture* and *Rural Economy*, the practice of having the wool of thefe animals cleaned by wafhing them in clear running water before they are clipped in the fummer feafon. It is obferved by the author of a late work on "Agricultural Chemiftry," that in wafhing fheep the ufe of water containing carbonate of lime fhould be avoided; as this fubftance decompofes the yolk of the wool, which is an animal foap, the natural defence of the wool; and that wool often wafhed in calcareous water becomes

comes rough, and more brittle. The wool in some breeds of sheep, as those of the finer kind, have it in larger quantity than others. See Sheep and Yolk.

Washing *Machine*. See Laundry.

WASHINGTON, George, in *Biography*, first president of the United States, the descendant of a respectable family in the north of England, was born in February 1732, on an estate in Westmoreland county, Virginia, on which his great-grandfather, John Washington, settled, after his emigration from England, about the year 1657. Having lost his father when he was about ten years of age, his advantages of education were inconsiderable; but he acquired a sufficient knowledge of mathematics to qualify him for a land-surveyor. In his youth he was grave and thoughtful, regular and diligent in the management of the business assigned him, dignified in his deportment, and exemplary and honourable in his whole conduct. Ardent in his temper, he manifested, at the age of fifteen, an inclination to enter into the British navy, and the place of a midshipman was procured for him; but his mother diverted him from his purpose. In his nineteenth year he was nominated one of the adjutants-general of Virginia, with the rank of major; and in 1753 he was entrusted with a commission which required prudence and resolution. At this time the French were projecting a communication between Canada and Louisiana by a chain of forts, which would have confined the English to the east side of the Alleghany mountains. Washington was the bearer of a letter of remonstrance to the French from Mr. Dinwiddie, the governor of Virginia. He executed the business committed to him, and returned in seventy-eight days. As the French persisted in their plans, the assembly of Virginia raised a body of three hundred men for the protection of their frontiers, and appointed Washington lieutenant-colonel. Hostilities commenced, though war was not declared between Great Britain and France; and Washington, with a detachment of his regiment, falling in with a party of French, surprised and made them all prisoners, after their commander was killed. With an augmentation of force, he proceeded for the purpose of dislodging the French from fort Duquesne; but receiving intelligence that a large force was approaching, he fell back into a stockaded fort, which he had previously erected at a place called Great Meadows, where he was attacked by the enemy. However he defended his post, incompletely fortified, for a whole day, and capitulated with the French commander upon honourable terms.

In 1755 war actually took place, and general Braddock was sent to command in America. Washington, now a colonel, offered to accompany him as a volunteer; and notwithstanding a severe illness, made haste to join the army. The carnage of the day was dreadful, and proved fatal to the general and many of his officers and men; but Washington maintained the most perfect self-possession, notwithstanding the scene he witnessed, and the personal danger to which he was exposed. He brought back the shattered remnant of the army; and his countrymen generally thought, that if he had had the command, instead of a man who was unacquainted with the Indian mode of fighting, the disaster would have been prevented. The assembly of Virginia determined, after the withdrawment of all the regular troops, to raise sixteen companies for the defence of their frontiers, and they entrusted the command with Washington; such was the degree of reputation which he had acquired at his early age! His situation was trying and perilous, an extensive frontier being open to the incursions of a savage enemy; he recommended more vigorous measures, and at length, when fort Duquesne was evacuated by the French, in 1758, in consequence of the successes of the British troops in the northern colonies, the back-settlements of the southern were secured. When this service was accomplished, Washington retired from the military service with the cordial esteem of his countrymen, and with tokens of respect from the officers of the British army. Soon afterwards he married Mrs. Custis, an amiable and opulent widow; and by the death of an elder brother he obtained an estate on the Potomack, called Mount Vernon, whither he removed, and commenced the life of a country-gentleman; sedulously improving his property by his agricultural skill, exercising the office of judge of the court in the county where he resided, and attending as a representative in the house of burgesses of Virginia. This was the honourable and useful life he led for fifteen years. But after the peace of 1763, contests commenced between the American colonies and the British legislature; and Washington determined in the assembly of Virginia to oppose the claim of the parent-state to a right of taxing its colonies. Accordingly he was elected a member of the first congress, which assembled at Philadelphia in 1774. He was a member of all the committees appointed for arranging measures of defence; and when it was determined to raise a general army, the arduous office of commander-in-chief was unanimously conferred upon him by the deputies of the twelve united colonies, to which Georgia afterwards acceded. He with becoming modesty and diffidence accepted the office, but declined all pecuniary compensation, desiring only the payment of his expences.

On his first assuming the command, the American army consisted of about 14,500 men, entrenched at different posts near Boston, and opposed to the British army on Bunker's-hill. An army like that of the Americans, consisting of raw recruits, enlisted for a limited time, and furnished by different colonial governments, and very indifferently provided with arms, ammunition, and stores, afforded a discouraging prospect to its commander, and required the exercise of singular talents. Washington seemed to possess such talents. Accordingly, notwithstanding all disadvantages, he was enabled, in March 1776, to commence active operations against the British army at Boston, by fortifying the heights of Dorchester, which commanded both the lines and harbour. The British were soon reduced to the necessity of quitting Boston and removing to Halifax; and the American general was welcomed at the former place as a deliverer. When general Howe, with a strong force, took possession of Staten island, the Americans were posted on Long island, under general Sullivan; but in August they were attacked and defeated with great slaughter. Washington was in the city of New York, endeavouring to preserve and rally the troops that had escaped in a dispirited state from this conflict. But being unequal to a successful resistance to the victorious army, he withdrew from New York to the interior of the country, and having retreated through the Jerseys, found himself at the head of no more than 7000 men. However, he maintained his self-possession and firmness, and determined to retaliate. The first object of his attack was a body of Hessians, stationed at Trenton. Crossing the Delaware, and hastening towards the town, he took them by surprise, and about nine hundred of them laid down their arms, besides others that were killed and wounded. This success was peculiarly fortunate, as the Americans dreaded the ferocity of the Hessians, and their spirits were thus roused to new exertions. Washington gained also an advantage over the British at Prince-town, and by these bold movements they were

obliged to abandon all their posts except two, which they retained to the southward of New York. Sir William Howe commenced the campaign of 1777 with attempts to bring the American army to action; but Washington, apprized of his design, evaded it by his manœuvres. Philadelphia was the next object to which the views of the British were directed: the American commander posted himself on Brandy-wine creek, in order to dispute their passage; and finding it necessary to risk a battle, he suffered a defeat, and was under a necessity of leaving the passage to Philadelphia open to the enemy. Having been reinforced, he made an attack upon the British troops at German-town, but was repulsed with loss, and took up his winter-quarters at Valley-forge, about 25 miles from Philadelphia. The events of this year had proved disastrous, and Washington experienced many difficulties in providing food and clothing for his army; and the people became discontented, alleging, in a tone of loud complaint, the success of general Gates, and the surrender of Burgoyne, as a contrast against his want of success. His patience and forbearance were invincible; he justified his conduct, and evinced his patriotism, by not yielding to a faction at such a critical period. The public voice, however, was in his favour, and thus supported, he determined to persevere. With the commencement of the year 1778, Washington concerted measures with Congress for ameliorating the whole military system. Washington has been called the American Fabius; but enterprising as his own spirit was, he was obliged by circumstances to assume this character. The alliance with France very much improved the situation of the Americans; this obliged the British army to evacuate Philadelphia, and their retreat was harassed, as much as possible, by the vigilance and activity of Washington. By a partial action at Monmouth court-house, they lost some men, and then pursued their march to Sandy-Hook. Washington received the thanks of Congress for his activity in this combat, whilst general Lee incurred censure, and was suspended from his command for a year by the sentence of a court-martial. Washington retired to New Jersey; and by his conciliatory manners and address compromised the differences that subsisted between the Americans and their French auxiliaries.

During the campaigns of 1779 and 1780, no great occasion presented itself for the display of Washington's military talents. The Americans had derived confidence in their expectation of ultimate success from the alliance and co-operation of France. The year 1781 commenced with a mutiny in the Pennsylvanian line of the army, which was occasioned by the inattention of Congress to the redress of their grievances. Washington on this occasion acted with great wisdom, and left the matter in litigation to be settled by the civil authorities, which granted their principal demands. But when the same mutinous spirit was extended to the Jersey brigade, he thought it right to interpose; and by a punishment of the ringleaders, the others were restored to their duty. He took this occasion of urging the different states to make exertions for removing the causes of discontent among the troops. This was a year that called for extraordinary activity. The British were pushing forward their successes with uncommon ardour in the southern provinces, and Virginia was experiencing the calamities of war. Washington was urged to defend his native province: but he knew no private interest in this general contest; and regarding America, rather than any particular district, as his country, he would not be induced to abandon his central post. It was now determined to combine the operations of the American and French forces, and the first object in contemplation was the siege of New York. But this measure was afterwards changed for that of an attempt against the army of lord Cornwallis, posted at York-town. Whilst Washington and Rochambeau kept up the deception of a design against New York, by passing Clinton's army without molestation, and marching by Philadelphia to Williamsburgh, the land and naval forces made an united attack upon the British troops at York-town. Their gallant commander was compelled to surrender his whole force on October 19, which event, in fact, terminated the war on the American continent. Its importance was such in the opinion of Washington, that he issued an order on the following day, that all under arrest should be pardoned and set at liberty, and that a thanksgiving service should be performed with due seriousness in the different brigades and divisions. He then returned, with the greatest part of the army, to the vicinity of New York. The British parliament, at an early period of the year 1782, declared its sense of the impolicy of the war by a vote against further offensive measures. Washington, however, with his customary precaution, urged the necessity of remaining fully prepared for another campaign; but in the course of the year the preliminaries were signed, and the independence of America fully recognized. Discontents prevailed in the army, under an apprehension that its claims for past services would be neglected; and, as an expression of such existing discontents, inflammatory addresses were circulated among the troops. Washington on this occasion exercised his conciliatory powers with wonderful effect. He cautioned the officers, individually, to avoid intemperate measures; and then, at a general meeting convoked by himself, he delivered to them an address, which produced an unanimous determination to trust their cause to the justice of Congress and their country. On the other side, Washington thought it his duty to urge Congress to make an adequate compensation to those who had so well served their country, and his advice was duly regarded. When the army was disbanded, in November 1783, their commander-in-chief took his leave of them by a most affectionate and admonitory address. He also, in the same month, made a public entry into New York, and soon after took a solemn leave of all his officers. The scene is described as equally tender and dignified. "The manly demeanour of the chief, softened by sensibility, filled every eye with tears. After grasping the hand of each in silence, he proceeded to the place of embarkation, followed by the officers in mute procession, with dejected countenances. On entering the barge he turned to his companions in arms, and waved his hat as a last adieu. Many answered with their tears; and all kept their eyes upon him till he was no longer distinguishable. On his way to Annapolis, then the seat of Congress, he delivered to the comptroller at Philadelphia an exact account, in his own hand-writing, of all the public money he had received, the whole amount of which, in eight years, was only between 14 and 15,000*l.* Nothing was charged for personal services. He then proceeded to the Congress, which received him as the greatest and best citizen of the United States. After a suitable address, he resigned his commission into the hands of the president, who in energetic terms expressed the national sense of his high merits. Such were the feelings of public gratitude towards him, that he could have asked nothing which would not readily have been granted; but making no request for himself, his family, or relations, he limited himself to an indirect recommendation to Congress of some young gentlemen without fortune, who had served him as aides-de-camp. He then hastened to mount Vernon, where he instantly laid aside the statesman and general for the country gentleman."

Not satisfied with attending merely to his own interest, he took

took pleasure in suggesting and accomplishing any scheme that tended to the improvement of the country. Accordingly, he zealously promoted a plan of inland navigation; and in gratitude for his services, the legislature of Virginia passed an act in order to vest in him 150 shares in the navigation of the rivers James and Potowmac. But this grant he would not accept, as he had resolved to decline all personal recompence for his services; but he consented to the act on condition of appropriating the proceeds to the maintenance of a seminary of learning in the vicinity of each river; which appropriation he confirmed by his last will.

When a general convention was agreed upon for revising the federal system of government, this convention assembled at Philadelphia in 1787, and unanimously chose Washington as president; and when the new form of government was settled, the late commander-in-chief was unanimously elected the first President of the United States, the honour of which election was announced to him at mount Vernon on the 14th of April, 1789. Independently of his reluctance to embark again in the toils of public life, he foresaw peculiar difficulties that would embarrass the measures of government in the first settlement of the American states. Nevertheless, having for many years devoted his time and services to the public cause, he still consulted the welfare of his country, in preference to all considerations of personal tranquillity and retired enjoyment. With these views he accepted the arduous office that had been so honourably assigned to him, and immediately commenced, as he faithfully continued, the discharge of its important duties. "After having steered the vessel of the state," says one of his biographers, "during an unquiet period of eight years, being now in the sixty-sixth year of his age, he thought proper to decline a new election to his high office. He announced this intention in a long and minute address to the people of the United States, replete with the most excellent advice for their future conduct, and the soundest views of their political state. It was a legacy of wisdom, which set the seal to all his past services."—"It was in the beginning of 1797 that Washington resigned his authority to his successor, Mr. Adams; on which occasion, whatever might be the feelings of a few party-zealots, he received abundant proofs of the general esteem and affection. He returned with pleasure to the comforts of domestic life, and resumed his agricultural and literary pursuits. From this state of privacy, however, he was called in the following year by the aggravated injuries of the French rulers, which produced a determination in Congress to arm by sea and land for a defensive war; and in consequence Washington was once more nominated to the chief command of the armies of the United States. The countenance, however, thus assumed, and the subsequent deposition of the Directory by Buonaparte, brought on an accommodation, and all military preparations were at an end."

When the services of this truly "great man," unparalleled perhaps in the history of the world, terminated, his life was hastening to a close. Having exposed himself to the rain, December 13, 1799, in attending to some improvements at mount Vernon, he was seized with an inflammatory affection of the wind-pipe, attended with fever, which baffled the efforts of his physicians, and terminated his life within thirty-five hours after his first seizure, without a struggle, and in the full possession of his reason, in the sixty-eighth year of his age. He left a widow, but no children. We shall close this article with the following delineation of his character by one of his biographers. "His moral and intellectual qualities were so happily blended, that he might seem expressly formed for the part assigned to him on the theatre of the world. His firm mind, equally inaccessible to the flatteries of hope and the suggestions of despondence, was kept steady by the grand principles of love to his country, and a religious attachment to moral duty. In him even fame, glory, and reputation, were subordinate to the performance of the task imposed upon him; and no one ever passed through the ordeal of power more free from the remotest suspicion of selfish or ambitious designs. Capable of strong and decisive measures when necessary, they were tempered with the lenity which flows from true benevolence. In person he was tall and well proportioned. His form was dignified, and his port majestic. His passions were naturally strong, but he had obtained a full command over them. In the character of his intellect, judgment predominated; to fancy and vivacity he had no pretension; but good sense displayed itself in all that he said or wrote. It was a proof of strong powers of acquisition, that, scanty as his literary education had been, by a careful study of the English language in its best models, he became master of a style at once pure, elegant, and energetic; and few better specimens of public addresses can be shewn than in the products of his pen. Many more brilliant characters appear in the pages of history and biography; scarcely any so thoroughly estimable." Ramsay's and Marshall's Lives of Washington. Gen. Biog.

WASHINGTON, in *Geography*, a county of the United States, in the district of Maine, bounded on the N. by Lower Canada, on the E. by New Brunswick, and on the S. by the Atlantic. The chief town is Machias, which contains 1570 inhabitants. The population of the whole county consists of 7870 persons.—Also, a town of Massachusetts, in the county of Berkshire, containing 942 inhabitants.

WASHINGTON, *Mount*, a town of Massachusetts, in the county of Berkshire, containing 474 inhabitants.

WASHINGTON, a town of New Hampshire, in the county of Cheshire, containing 820 inhabitants.—Also, a town of Vermont, in the county of Orange, containing 1040 inhabitants.—Also, a town of Connecticut, in the county of Litchfield, containing 1575 inhabitants.—Also, a county of New York, which received its present name in 1784, in honour of George Washington, having been before called Charlotte county, when it also included a part of the present state of Vermont. It was organized in 1788 and 1801. It is bounded N. by Essex county, E. by the state of Vermont, S. by Rensselaer and Saratoga counties, and W. by Saratoga and Montgomery. Its form is irregular, being in its greatest length, N. and S. 59 miles, and greatest breadth, 45. The area is about 1612 square miles, or 1,031,680 acres, including the waters. It is situated between 42° 55′ and 43° 48′ N. lat., and 45′ E. and 12′ W. long. from New York. It includes 21 towns, of which the capitals are Kingsbury and Salem. In 1810 its population consisted of 44,289 persons, and its senatorial electors were 4079. The country round lake George is hilly, and, especially in the northern part, presents summits of 6, 8, 900 to 1100 feet altitude; but the hills are interspersed with valleys, that afford a tolerable good soil for farming. But the southern part contains a large proportion of arable land, with a warm light soil. The agriculture of the southern part of Washington county is very respectable and productive. In the northern part the pine forests supply large quantities of lumber, in logs, square timber, boards, shingles, &c., that descend the Hudson in rafts. Few counties produce more of clothing from household industry. The mineralogy of this county includes slate, limestone, marble, bog iron-ore, lead-ore, and some mineral springs.

ſprings. Waſhington ſends five members to the houſe of aſſembly.

Washington, a poſt-townſhip of New York, in Ducheſs county; 80 miles S. of Albany; about 7 miles ſquare, and watered by Wappinger's creek. The ſoil is good for farming, and affords excellent wheat, being under good cultivation. The inhabitants are principally farmers; and there are 80 looms in families, which in 1810 produced 20,750 yards of cloth for common clothing. Near the centre of the townſhip is the handſome village of Mechanic, containing about 20 dwellings, a quaker-meeting, and a ſchool. About 2 miles N.W. from Mechanic is another village, including about 20 houſes, a woollen manufactory, and ſeveral mills, and called Hartſville. In 1810 the whole population compriſed 2854 perſons, and 180 electors.

Washington, a town of New Jerſey, in Burlington county, containing 1273 inhabitants.—Alſo, a town of New Jerſey, in Morris county, containing 1793 inhabitants.—Alſo, a county of Pennſylvania, containing 36,289 inhabitants, of whom 36 are ſlaves.—Alſo, a townſhip of Pennſylvania, in the county of Northumberland, containing 438 inhabitants.—Alſo, a townſhip of Pennſylvania, in the county of York, containing 941 inhabitants.—Alſo, a townſhip of Pennſylvania, in the county of Franklin, containing 2709 inhabitants.—Alſo, a townſhip of Pennſylvania, in the county of Indiana, containing 755 inhabitants.—Alſo, a town of Pennſylvania, in the county of Waſhington, containing 1301 inhabitants.—Alſo, a townſhip of Pennſylvania, in the county of Weſtmoreland, including 1695 inhabitants.—Alſo, a townſhip of Pennſylvania, in the county of Lycoming, having 675 inhabitants.—Alſo, a county of Maryland, on the W. coaſt of the Cheſapeak, containing 18,730 inhabitants, of whom 2656 are ſlaves.—Alſo, a county of Virginia, bordering on North Carolina, containing 12,136 inhabitants.—Alſo, a ſea-port town of North Carolina, formerly called Bath, ſituated on the north ſide of Pamlico river, with a good harbour; 20 miles N.N.E. of Newbern. N. lat. 35° 31′. W. long. 77°.—Alſo, a county of Ohio, bordering on lake Erie, containing 5991 inhabitants.—Alſo, a townſhip of Ohio, in the county of Clermont, containing 1527 inhabitants.—Alſo, a townſhip of Ohio, in Franklin county, including 280 inhabitants.—Alſo, a townſhip of Ohio, in the county of Miami, containing 787 inhabitants.—Alſo, a townſhip of Ohio, in the county of Montgomery, including 1584 inhabitants.—Alſo, a townſhip of Ohio, in Pickaway county, containing 974 inhabitants.—Alſo, a townſhip of Ohio, in Prebble county, containing 440 inhabitants.—Alſo, a county of Kentucky, including 12,999 inhabitants, of whom 2185 are ſlaves. Its town of Springfield contains 249 inhabitants, 60 being ſlaves.—Alſo, a town of Kentucky, in Maſon county. The county contains 11,071 inhabitants, 2065 being ſlaves; and the town includes 815 inhabitants, 251 being ſlaves.—Alſo, a county of North Carolina, containing 3464 inhabitants.—Alſo, a county of Eaſt Tenneſſee, containing 7740 inhabitants, 850 being ſlaves.—Alſo, a county of Georgia, containing 9940 inhabitants, 3513 being ſlaves.—Alſo, a town of Georgia, near which is a medicinal ſpring; 13 miles S.W. of Peterſburg. N. lat. 33° 47′. W. long. 82° 16′.—Alſo, a town of Georgia, in Wilkes county; the county and town containing 14,887 inhabitants, of whom 7666 in the county, and 218 in the town, are ſlaves.—Alſo, a county of the Miſſiſſippi territory, containing 2920 inhabitants, of whom 900 are ſlaves.

Washington, *Town of*, in the territory of Miſſiſſippi, containing, together with the city of Natchez and Adams county, 10,002 inhabitants, 459 in Natchez, 182 in Waſhington, and 5030 in Adams county being ſlaves.—Alſo, a townſhip of Harriſon county, in Indiana territory, containing 1257 inhabitants, 6 being ſlaves.—Alſo, a city of Columbia, containing 8209 inhabitants, of whom 1437 are ſlaves. George-town includes 4943 inhabitants, of whom 1162 are ſlaves. This city is ſituated on the river Potomack, and intended to be the capital of the United States, and the ſeat of the Congreſs. According to the plan, the city is to be divided into ſquares or grand diviſions, by ſtreets interſecting each other from the cardinal points, with diagonal ſtreets from ſome of the principal parts, as from the preſident's houſe to the capitol, and ſome other points. All houſes to be built of brick or ſtone, with the walls parallel to the ſtreets; and the walls in ſtreets meaſuring 160 feet in breadth, to be at leaſt 30 feet in height. The area of the capitol, or houſe for the legiſlative bodies, is to be ſituated on an eminence about a mile from the Potomack, and nearly the ſame diſtance from the eaſtern branch. The houſe for the preſident to be near the Potomack, within view of the capitol. In different parts of the city, where the principal ſtreets croſs each other, are areas in a variety of regular forms; of theſe fifteen are appropriated to the different ſtates of United America, for the erection of monuments, obeliſks, or ſtatues; and on a ſmall eminence, weſt from the capitol, is to be erected an equeſtrian ſtatue of general Waſhington; at the junction of the rivers, a fort is to be erected, with an arſenal and magazines. Moſt of the ſtreets have been marked out, and the ſquares divided into lots in the year 1792, ſince which time ſome thouſand workmen have been conſtantly employed; 140 miles S.W. of Philadelphia. N. lat. 38° 57′. W. long. 77° 8′.—Alſo, a county of Columbia, which, excluſive of the city and George-town, contains 2315 inhabitants, 955 being ſlaves.

Washington's *Iſlands*, iſlands near the weſt coaſt of North America. Captain Dickſon diſcovered theſe iſlands in 1787, and called them *Queen Charlotte's Iſlands*. Captain Gray, of the United States, diſcovered them in 1789, and called them *Waſhington's Iſlands*.

WASHITA, or Ouachitta, or *Ouachitau*, called alſo *Black River*, a river of Louiſiana, which is the principal tributary ſtream of Red river; the latter commencing in the low ſandy hills, or Caous mountains, near Santa Fè. Black is now uſed to deſignate the united waters of Ouachitau, (properly ſo called,) Ocatahoolu, and Tenſaw rivers; but Ouachitau having gained a more deſerved attention than the other branches, the name of that is uſed, without impropriety, to deſignate the valley between the Miſſiſſippi, Arkanſaw, and Red rivers. This valley is upwards of 350 miles in length, and its broadeſt part from the Quepa village on Arkanſaw, to the heads of Derbene river, 150 wide. It is nearly elliptic in its form, and averages from 70 to 80 miles wide, extending over more than 25,000 ſquare miles of ſurface, and upwards of 16,000,000 American acres, which contain large tracts of fine arable ſoil, many places that indicate mineral wealth, and an excellent climate. The principal branch of the Ouachitta takes its ſource from the mountainous prairies between Red and Arkanſaw rivers, about 34° N. lat., and W. long. 95° 30′. The mountains from which it flows are compoſed of ſecondary materials: marine exuvia are found every where mixed with the ſchiſtus, argillaceous earth, and other matters that compoſe the face and interior of theſe rugged mountains. No granitic maſs is found; but the whole face of the country indicates marine ſubmerſion at ſome remote period. The Fourche au Cado, Little Miſſouri, and Saline branches of Ouachitta, riſe in the ſame ridge with the principal ſtream. The ſoil round the head of Ouachitta reſembles that of the

salt plains of Texas in sterility; but it improves in quality below the nucleus of the mountains. Indications of metal become more rare, and timber, particularly pine, upland black oak, ash, linden, and logwood, is abundant. The soil is adapted to the culture of small grain, legumes, the potatoe, and almost every plant and herb suitable to the climate. Cotton succeeds on all the arable lands of Ouachitta. Here are also some salt springs of good quality. About N. lat. 35° 10′, Ouachitta is joined by the Saline, and also the Derbene, which rise in N. lat. 32° 50′, and W. long. 92° 10′. About three miles below the Derbene the river Barthelemy falls into it. The last and largest branch of Ouachitta is the Rivière aux Bœufs, or Ox river, which rises in the angle formed between the Missouri and the Arkansaw. Below the mouth of the Bœuf river, all the waters which form the Ouachitta being united, the river, though apparently not longer than 200 miles above, becomes much deeper, and may be navigated at all seasons. In this situation, on the same side with Bœuf, Sicily island rises from the bank of Ouachitta. The hill of Sicily is very fruitful, its surface being a black loam. On this island are several settlements. Fourteen miles below the Bœuf, the Ouachitta loses its name by its union with the rivers Tensaw and Ocatahoolu. The united stream is hence called Black river, which, after a short and very winding course of thirty miles, unites with Red river. Its banks are very fertile, its width about 200 yards, the current gentle, and the water throughout the year deep enough for large boats. Thirty miles below the mouth of Black river, the Red river joins the Mississippi. Red river rises about thirty or forty miles east of Santa Fé, about N. lat. 37°, and W. long. 105°; and having pursued a course S.E. by E. 450 miles, receives the False Ouachitta from the N. This latter river rises in the Caous mountains, N. of Red river, and is a beautiful stream nearly as large. These two rivers form a junction at a small distance below the Panis, or Towiache towns, and about 70 miles lower down receives the Blue river from the N. This latter issues from the Caous mountains, and runs in a course nearly parallel to the False Ouachitta. The united waters of these rivers form Red river, now a large stream, turbid and brackish from the waters of Red river, properly so called, and Blue river. The immense column of water brought down by the various streams that form Red river, causes it to overflow its banks during the spring floods. About N. lat. 33°, a chain of lakes commences on each side, near to or farther from the river; and these lakes are the natural deposit of the water, which would otherwise overflow the whole country. The beds of these lakes are much lower than that of the channel of the river. When the waters have been drained by the depression of the river in the fall months, the beds of most of these lakes become dry, and exhibit a meadow of succulent herbage, with channels for the water that continues meandering through them. The Red river enters the Mississippi in N. lat. 31° 1′, and W. long. 91° 45′; and if the Atchafalaya be considered as the continuation of the Red river, it leaves the Mississippi three miles below. See Darby's Description of Louisiana; Philadelphia, 1816.

WASHMINSKER Islands, a cluster of islands near the south coast of Labrador. N. lat. 50°. W. long. 60°.

WASIGNY, a town of France, in the department of the Ardennes; 9 miles N. of Rethel.

WASILAX, a town of Sweden, in North Finland; 55 miles S.E. of Biorneborg.

WASILISKI, a town of Lithuania; 16 miles S.W. of Lida.

WASILKOW, a town of Lithuania; 30 miles S.W. of Grodno.

WASKEMASHIN, an island in the gulf of St. Laurence, near the coast of Labrador. N. lat. 50° 3′. W. long. 59° 56′.

WASKLOT, a small island on the east side of the gulf of Bothnia. N. lat. 63° 6′. E. long. 21° 20′.

WASKUACHAOUIPIOU, a river of Canada, which runs into the Saguenay, N. lat. 48° 20′. W. long. 70° 18′.

WASMA, a town of Sweden, in the province of Smaland; 7 miles S.S.W. of Calmar.

WASMUT, a town of Prussia, in the province of Oberland; 14 miles S. of Marienwerder.

WASP, in *Natural History*. See Vespa.

Wasps are not unfrequently dangerous and hurtful to many sorts of animals by their sting, in consequence of the pain and irritation that are thereby produced. The best remedies in these cases are probably the full use of ammoniated vinegar, or saturnine washes, as cold as possible to the parts, keeping them constantly wet with them by means of cloths wrung out of them. Such insects are, however, capable of being destroyed in many different ways, as by finding their works and retreats, and smoking them well with any combustible material, but especially sulphur: by putting cyder, verjuice, wine, or any other sour or sweet liquid, into short-necked phials, many of them may be readily taken and destroyed; and by laying treacle, sweet apples, or any such substances, in earthen dishes, mixed with a little water, or of any liquid of which they are fond, great numbers of them may be exterminated without difficulty. When pieces of lighted brimstoned rags are thrust into the nests and holes formed by wasps, they should be immediately covered by the foot, or with earth, when they will be speedily destroyed without any escaping.

In the garden-culture of various kinds of fruit, as well as in the hot-house, vinery, and other such houses, wasps are often particularly troublesome, destructive, and rapacious; it is of course necessary to destroy them, and to prevent the means of their depredations in many cases. The best and most effectual means of getting quit of them is that of destroying their nests, which is effected simply by noticing the course of their flight from the garden or place in a quiet sunny day, and pursuing them as far as they can be seen flying, then waiting until others pass, and doing the same until they reach their habitations. The place being thus found and marked, in the evening when they are all in, a lantern and candle, with a match of damped gunpowder, made into a roll on the end of a small piece of wood, is to be provided; it is lighted when at the nest, and burns like a squib, when it is introduced into the hole leading to the nest, the foot being put on it for a few minutes. The ground is then dug until the works are seen, when the whole is wrought together like mortar by means of water. In case the nest happens to be on a bush or tree, the match is put below it, when the wasps soon fall stupified to the ground, and are destroyed without difficulty.

In this way, wasps' nests, in one season, have, it is said, been destroyed to the amount of more than fifty, within the distance of three hundred yards of a garden, and without getting a single sting, or passing a single wasp. They thus diminish every year in number, and if the same method were generally used, there is not the smallest doubt, that much fine fruit would be preserved, and at the same time many honey bees saved, which are now much destroyed by wasps.

By the common mode of hanging up phials against trees and other objects, many wasps may be taken and destroyed too, but the hive is still breeding more: large white glass vessels

veffels of this fort are, however, very ufeful for deftroying the large *black* flies, which are alfo fo deftructive of peaches. Putting a little jam or jelly into them is found to have a good effect in enticing them to enter fuch bottles.

Cherries, ftrawberries, rafpberries, goofeberries, plums, and many other forts of fruit, are frequently almoft inftantly deftroyed, as they become ripe and ready for ufe, by the voracity of wafps.

The prevention of wafps from entering hot-houfes, vineries, and other houfes, where fine fruit is raifed, and committing their voracious depredations, has been attempted in different ways, as lately by covering them with a kind of cloth, which is called *fcrime*, that is found by experience in repeated trials to anfwer the purpofe extremely well. The cloth is made in the form of a fheet or fail to fuit the dimenfions of the houfes, and is bound round the outfides with a fort of tape. Barking it, as in fifh-nets, would be ferviceable, but it will do without it. The cloth is about a yard in width, and cofts eight-pence or nine-pence the yard. Another kind, a little different, is higher priced.

As foon as the grapes are beginning to ripen, or the wafps make their appearance, it is time to put on the cloth, which is done with fmall tacks, and only in fuch a manner as will let the fafhes go up and down freely; the cloth will not need to come any farther down than the bottoms of the top fafhes. The cloth is fo very thin, that it will permit plenty of air to pafs, without the wafps attempting to go through. It does not exclude much fun, nor will it hurt the grapes in the fmalleft degree.

When the hot-houfe or vinery ftands by itfelf, or in the middle of a range, the manner of preventing the wafps from getting in when the door is opened, or when any perfon is paffing from one houfe to another, is this. The cover being faftened at the top of the door with fmall tacks, as upon the outfide roof, and the fides of it upon fmall hooked wires, is thus capable of being taken off at one fide in fuch cafes; and if the door be wanted to ftand open for the fake of air at any time, the fame purpofe will be anfwered.

In cafe the houfe has fafhes in front, the cloth may be nailed upon the outfide or infide, according as the fafhes fhift by the hand, or are drawn up and down by a rope, ftill giving plenty of air as wanted. A fingle wafp has never been feen, it is faid, to attempt to get in by the tops of the glafs.

Various ways are attempted and practifed of keeping wafps from grapes. The bunches of grapes are fometimes put in paper-bags; but the exclufion of air caufes them to damp off. Gauze bags are alfo occafionally put upon them, which are ftill more expenfive, and give a good deal of trouble. The above method, however, affords free air and free accefs at all times, and preferves the grapes in good order: befides, it is pleafant for the owner or others to go into the vinery and pull the grapes without being molefted by wafps, rather than having it to refemble a hive of bees with the buzzing that is produced by them.

As foon as the fruit is all cut or pulled, the cloth fhould be taken off, well wafhed, and then kept in a dry place until wanted again.

Another method of effecting the fame purpofe, which is perhaps better and more ready in fome cafes, is that of wire-grates or frames. Where the glafs in vineries is crofs-puttied, frames or grates are made three feet fquare for the top and bottom of every third fafh, the fafhes being all moveable: thefe frames or grates are formed fo as exactly to fit in between the rafters, and are placed fo as that the fafhes can move up and down over them, and that there may not be fo much vacuity between them and the frames as to admit a wafp, a groove is cut on the under fide of the upper bar of each fafh, to admit the rope by which the fafhes are hung. When it comes in contact with the under part of the wire-grate or frame next to the wall-plate, there is an aperture to admit the pulley; the end of which inclines downward from the run of the fafh, in order to give room for the rope and pulley to work with freedom in opening and fhutting.

The frame is made of fir-wood well feafoned to prevent its warping, and is an inch and a quarter thick; the fides and lower end are two inches, and the upper end, where the pulley is inferted, is fix inches in breadth. The open fpace is covered with wire of the fize number feventeen, worked about one-eighth of an inch afunder, and inferted into the wood at both ends. There are crofs wires of the fize number five, placed at fix inches diftance from each other, to which the longitudinal wires are warped, in order to keep them firm. In each of the frames, holes are made with fmall wire turned down, fimilar, in fome meafure, to thofe in the entrance into wire moufe-traps. At thefe, large phials half filled with four beer are placed. The wafps are eager to get into the grapes by every poffible means of entry, and are next enticed by the beer to get into the phials, where they perifh in numbers.

The frames or grates are conftructed in this open manner in order to admit the air freely, as it is of great importance, efpecially in the ripening of fruit.

Thefe frames are capable of being made at a very trifling expence; and as they are in ufe but a very fhort time in a feafon, the coft of making new ones will but feldom recur.

Wasp-*Fly*, a fpecies of fly having very much the external figure of a wafp, but harmlefs, without a fting, and with only two wings.

It is black and yellow on the body, and marked exactly as the wafp, and is produced from a fpecies of the rat-tailed fly-worms. See Drone-*fly*.

But befide thefe there is another fmall fly produced of the puceron-eaters, which has extremely the appearance of a fmall wafp; but is perfectly harmlefs, and has only two wings. Reaumur, Hift. Inf. vol. iv. p. 486.

Wasp-*Tipula*, the name of an infect defcribed by M. Reaumur, and being properly a tipula, or long-legs, though greatly refembling a wafp.

This is produced of a worm found in the earth, lodged in the cavities of old trees; the worm has no legs, but has a regularly figured fcaly head. The fly produced from it has the long legs and the mouth of the tipula, with the remarkable double beard which covers it, and which makes the reat character of this clafs of infects; but then the body is fhort and thick, whereas the bodies of the common kinds are very bony and thin. This, as alfo the breaft, is variegated with ftreaks of black and yellow, in the manner of the wafp; and its antennæ are very beautifully feathered, and bearded like thofe of the males of many of the gnat-kind. The head is black, and the legs are yellowifh. The wings have a yellowifh caft, and near their end have each a large fpot of brown. The body of the female of this fpecies is always much thicker than that of the male; and the fexes are eafily diftinguifhed by this. Reaumur, Hift. of Inf. vol. ix. p. 19.

WASS Island, in *Geography*, an ifland of the Atlantic, near the coaft of America. N. lat. 44° 28′. W. long. 67° 30′.

WASSAB, or Warshabs, a country of Africa, on the Gold Coaft; the foil is barren, but abounds in gold.

WASSAIL, or WAS-HEAL, the ſalutation of our anceſtors on occaſion of drinking to each other, ſignifying "health be to you."

The term is purely Saxon; and though it is now uſed in a very limited ſenſe, and only at the time of Chriſtmas, it anciently ſignified mirth and feſtivity in general; and in this ſenſe it occurs in Shakſpeare's Hamlet and Macbeth. Dr. Percy alſo uſes it in a general ſenſe; and Ben Jonſon perſonifies Waſſel, as "a Songſter," &c. In the "Ordinances for the Royal Houſhold," publiſhed by the Society of Antiquaries, there is a curious account of the ceremony of waſſelling at court on twelfth night in the reign of Henry VII. "When the ſteward cometh in at the doore with the waſſel, he muſt crie three times, 'waſſel, waſſel, waſſel,' and then the chaplain was to anſwere with a good ſonge."

In the 1ſt vol. of the Antiquarian Repertory is an account and engraving of an oaken chimney-piece in a very old houſe at Bexley in Kent, on which is carved a waſſel-bowl, reſting on the branches of an apple-tree. On one ſide is the word Waſsheil, and on the other Drincheile. This is at leaſt as old as the 14th century.

Groſe, in his Provincial Gloſſary, ſays, that the cuſtom of throwing toaſt, and pouring out libations to apple-trees for proving a fruitful year, which ſeems to be a relic of the heathen ſacrifice to Pomona, was called "Waſſel:" the term is ſtill applied to the drinking-ſongs ſung in the cyder-counties on the eve of Epiphany, when that ceremony is performed.

In Holderneſſe, and other parts of Yorkſhire, and probably in other counties, it is the cuſtom to carry about with the waſſel-cup an image of our Saviour, together with a quantity of roaſted apples. The image ſeems to have been connected with waſſelling originally, and to have become an appendage to the waſſel-cup. Hence this ancient cuſtom has been reſtricted to the convivial ſeaſon of Chriſtmas. But the apples ſeem to have been connected with it at a much earlier period. The cuſtom alſo of roaſting apples on Chriſtmas eve ſtill continues in ſome diſtricts. The origin of the term waſſel is traced to the ſtory of Vortigern and Rowena, the daughter of Hengiſt. On their firſt interview, ſhe kneeled before him, and preſenting a cup of wine, ſaid, *Hlaford Kyning, Waes-heil*, i. e. Lord king, health be to you! The king being unacquainted with the Saxon language, aſked the meaning of the terms, and being told that they wiſhed his health, and that he ſhould anſwer by ſaying *drinc heil;* he did ſo, and commanded her to drink: then taking the cup, he kiſſed the damſel and pledged her. From this time the cuſtom long remained in Britain, that whoever drank to another at a feaſt ſaid *Wacht heil*, and he that received the cup anſwered *drinc heil*. The *waſſel-ſongs* were ſung during the feſtivities of Chriſtmas, and in earlier times by the itinerant minſtrels; of whom, with the practice, ſome remains may be traced in our preſent *waits* and *carols*. One of them is preſerved in the Britiſh Muſeum. (Bib. Reg. 16. l. viii.) It is an Anglo-Roman drinking-ſong, probably older than the 13th century, and compoſed when the Norman language was familiar in this country. See Archæolog. vol. xi. p. 411.

WASSAIL-*Bowl*. See GRACE-*Cup*.

WASSANAH, in *Geography*, a city of Africa, within ſight of the river Zolibib (the Joliba of Park), whither the king of Tombuctoo ſent a caravan, accompanied by Sidi Hamet; and where they were welcomed by the king, and lodged in a ſquare incloſure, remaining there two moons, and exchanging their goods for ſlaves, gold, elephants' teeth, &c. The river, as Sidi Hamet informs us, which paſſes by Waſſanah, is called Zadi; it flows nearly ſouth, and is ſo broad, that a man can ſcarcely be ſeen on the oppoſite bank. On each ſide is a ridge of mountains, but ſeparated by an interval on both ſides from the river. The city appeared to contain twice as many inhabitants as Tombuctoo; it was ſurrounded by a very large wall, built of great ſtones looſely piled up; and a whole day was required to walk round it. The country around it is highly cultivated. The houſes are conſtructed of ſtones without cement, and roofed with reed and palm-leaves. The king of Waſſanah is called Oleekov; he is tall and young; his palace is very large, ſquare, and high, built of ſtone, with a ſpecies of cement. He was ſaid to have 150 wives, and 10,000 ſlaves; he has alſo a large army, which fight with guns, ſpears, bows, and arrows. When he goes out he rides on a huge beaſt called il ſement (elephant), and is attended by 200 guards. The people are not Muſſulmans, but addicted to various Pagan ſuperſtitions; for which reaſons, though they are honeſt, hoſpitable, and kind-hearted, Sidi Hamet allows the pious wiſh "that they may ſoon be driven out of the goodly land." The inhabitants catch many fiſh; they have boats made of large trees, hollowed out, and capable of holding ten, fifteen, or twenty negroes; and the king told Sidi Hamet that he was ſoon to take ſixty boats and 500 ſlaves to the great water, where he ſhould ſell them to a pale people in large boats, with muſquets, powder, tobacco, blue cloth, knives, &c. He ſaid it was a long way, and would take him three moons to get there, and that he ſhould be gone twenty moons before he could return, but that he ſhould then be very rich. Some perſons who had ſeen theſe pale people, and uſed to deal with them for ſlaves and teeth, ſaid, that they lived in great boats, and had guns as big as their bodies, that made a noiſe like thunder, and would kill all the people in 100 negro boats, if they went too near them. Sidi Hamet ſtaid in this place during the months of March and April; and it rained inceſſantly. Sidi Hamet's narrative, if authentic, is important, in a variety of reſpects. The deſcription of Tombuctoo (which ſee) correſponds to that of Adams. We may ſay the ſame of the name Zolibib, anſwering to the Joliba of Park, Gallu, or Julbi, of Horneman. Horneman alſo ſtates, that this river on the eaſtern part of its courſe is called Zad, and it there turns rapidly northwards. On the whole, the preſumption ſeems to be in favour of the narration, and it certainly opens very intereſting views of the interior of Africa. See Riley's Narrative of his Capture and Adventures in 1815, in Murray's Hiſtorical Account of Diſcoveries and Travels in Africa, vol. i. 8vo. 1817.

WASSAW ISLAND, *Great*, an iſland in the Atlantic, near the coaſt of Georgia, 16 miles in circumference. N. lat. 32° 52′. W. long. 81° 8′.

WASSAW *Iſland*, *Little*, an iſland in the Atlantic, near the coaſt of Georgia, to the ſouth-weſt of Great Waſſaw.

WASSAW *Sound*, a bay on the coaſt of Georgia, between Great Waſſaw iſland and Tybee iſland.

WASSELA, a country of Africa, bounded on the north and weſt by Mandinga and Bambarra, on the eaſt by Kong, and on the ſouth by Guinea. N. lat. 10° 50′ to 12° 20′. W. long. 4° 50′ to 5° 45′.

WASSEMBERG, a town of France, in the department of the Roer, on the Roer; 9 miles E.S.E. of Ruremond. N. lat. 51° 4′. E. long. 6° 6′.

WASSEN, a town of Switzerland, in the canton of Uri; 13 miles S. of Altorff.

WASSEN's *Bay*, a bay on the east coast of Cochinchina. N. lat. 12° 5'. E. long. 109° 6'.

WASSEN's *Point*, a cape on the east coast of Cochinchina, and south boundary of Wassen's bay. N. lat. 12° 3'.

WASSERBILLICH, a town of France, in the department of the Forests, at the union of the Sour and Moselle; 15 miles N.E. of Luxemburg.

WASSERBURG, a town and lordship of Germany, belonging to the family of Fugger, situated on a projected point of land in the lake of Constance; 1 mile N. of Buchorn.—Also, a town of Bavaria, with a castle and four churches; the chief trade is in salt; 38 miles W.N.W. of Salzburg. N. lat. 48° 3'. E. long. 12° 13'.

WASSERLEBEN, a town of Germany, in the county of Wernigerode; 4 miles N.W. of Wernigerode.

WASSER-MUNGENAU, a town of the marggravate of Anspach; 4 miles S.E. of Windsbach.

WASSERNDORF, or WECHSELDORF, a town of Germany, in the lordship of Seinsheim; 3 miles S.E. of Mark Breit.

WASSERTRUDINGEN, a town of Germany, in the principality of Anspach, on the Wernitz; 13 miles S. of Anspach. N. lat. 49° 2'. E. long. 10° 35'.

WASSIGNY, a town of France, in the department of the Aisne; 16 miles N. of Vervins.

WASSIHOO, a small town of Africa, in the kingdom of Ludamar, in N. lat. 14° 49', where the cultivation of corn is carried on to such an extent, that hunger is never known; men and women labouring in concert; 75 miles E.S.E. of Benowm.

WASSILT, a town on the east coast of Gilolo. N. lat. 1° 17'. E. long. 128° 6'.

WASSLONNE, a town of France, in the department of the Lower Rhine; 12 miles W. of Strasburg.

WAST, a town of France, in the department of the Straits of Calais; 9 miles E. of Boulogne.

WASTARA, a town of Hindoostan, in Bednore; 15 miles W.S.W. of Sacrapatam.

WASTCHEID, a town of France, in the department of the Meurte; 6 miles S.E. of Sarrebourg.

WASTE, or WAST, *Vastum*, in *Law*, has divers significations.

It is used for a spoil, made either in houses, woods, lands, &c. by the tenants for life, or for years, to the prejudice of the heir, or of him in reversion, or remainder.

Waste is either voluntary, as by pulling down a house; or permissive, as by suffering it to fall for want of necessary reparations. Whatever does a lasting damage to the freehold or inheritance is waste: therefore the removing of wainscot, floors, or other things, once fixed to the freehold of a house, is waste.

Waste may also be committed in ponds, dove-houses, warrens, and the like; by so reducing the number of erections therein, that there will not be sufficient for the reversioner when he comes to the inheritance. To cut down trees that are deemed timber, as oak, ash, and elm, and other trees generally used in building, or to lop them, or do any other act by which the timber may decay, is waste. The conversion of land from one species to another is waste; and also to convert one species of edifice into another, even though it is improved in its value. To open the land to search for mines of metal, coal, &c. is waste; and, in general, whatever tends to the destruction, or depreciating the value, of the inheritance, is constituted by the law as waste.

In consequence of the statute of Marlbridge, 52 Hen. III. cap. 23. and that of Gloucester, 6 Edw. I. cap. 5. all tenants for life, or for any less estate, are punishable or liable to be impeached for waste, both voluntary and permissive; unless their leases be made, as sometimes they are, without impeachment of waste, *absque impetitione vasti*; that is, with a provision or protection that no man shall *impetere* or sue them for waste committed.

The punishment for waste committed was, by common law and the statute of Marlbridge, only single damages, except in the case of a guardian in chivalry, who also forfeited his wardship by the provisions of the great charter, 9 Hen. III. cap. 4. But the statute of Gloucester directs, that tenants in dower, by courtesy, for life, and for years, shall lose and forfeit the place in which the waste is committed, and also treble damages, to him that hath the inheritance. For this purpose a writ of waste is brought by him who hath the immediate estate of inheritance in reversion or remainder, calling upon the tenant to appear and shew cause why he hath committed waste; and if the defendant makes default, or doth not appear at the day assigned him, then the sheriff, with a jury of twelve men, is to go to the place alleged to be wasted, and there inquire of the waste done, and the damages; and make a return or report to the court, upon which report the judgment is founded. But if the defendant appears, and afterwards suffers judgment to go against him by default, or upon a *nihil dicit*, this amounts to a confession of the waste; and the sheriff shall then only make inquiry of the quantum of damages. When the waste and damages are thus ascertained, by confession, verdict, or inquiry of the sheriff, judgment is given, in pursuance of the statute of Gloucester, cap. 5, that the plaintiff shall recover the place wasted, for which he has immediately a writ of seisin, and also that he shall recover treble the damages assessed by the jury.

The redress of this injury of waste is also preventive, by writ of estrepement: and, besides, the courts of equity, upon bill exhibited therein, complaining of waste and destruction, will grant an injunction to stay waste, until the defendant shall have put in his answer, and the court shall thereupon make farther order: which is now become the most usual way of preventing waste. Blackst. Com. book ii. book iii. &c.

WASTE is also taken for those lands which are not in any man's occupation, but lie common.

They seem to be so called, because the lord cannot make such profit of them as of his other lands; by reason of the use others have thereof, for passing to and fro. Upon this none may build, cut down trees, dig, &c. without the lord's licence.

Much land of this kind is met with in almost every district of the kingdom, which is very capable of being converted to a state of profitable cultivation without any very great expence, after it has been inclosed. The whole extent of the land yet in the state of waste is very considerable, and stated by different writers, as drawn from the best authorities, at upwards of six millions of acres, four of which at least are supposed capable of being brought into cultivation for the growth of crops of the most useful kinds.

It has been suggested by the writer of an excellent paper on the "production and consumption of corn, &c." in the fifth volume of Communications to the Board of Agriculture, that if this addition of land were cultivated, it would very much extend the productive territory of the country, and that as it must be cultivated chiefly for tillage, would be

be a timely and desirable addition to the corn land of the kingdom.

It is, of course, a question of much general interest and importance, whether a considerable portion of the capital employed in the enclosure and improvement of waste land, may not often be more beneficially applied in the amelioration of land already in a state of partial cultivation.

The scarcity of corn, which prevailed throughout the kingdom a few years since, acted, however, it is said, as a powerful stimulus to the enclosure and improvement of waste land in this country, and that the spirit which was then excited has not yet by any means subsided. And it is now perhaps still more necessary, as affording a means of providing a large increase of productive labour for a portion of the working class of society. As there is now a great deal less than a sufficiency of labour for the demand of the country, it would probably be politic in the state to convert a part of such unrequired portion of it to the means of extending the culture and fertility of the territory of the nation. It has been properly suggested, that new land ought not to be improved at the expence, or by the neglect of the old, but in addition to it, and from new resources.

In a subject of this kind, particular circumstances must be regarded. In some waste lands, from their situations and the quality of their soils, they are capable of being brought into a state of high cultivation and improvement, with comparatively but little labour and expence; while, in others, the circumstances are such as to render any attempts at the amelioration of them productive of great expence, and probably of but little profit. Indeed the same quantity of labour and expence which would be necessary to divide and cultivate them, would in all probability raise a much larger proportion of produce, if applied to lands already enclosed, but in an imperfectly cultivated state.

It is remarked, by the able writer of an agricultural report of a northern district, in support of improving waste land, that as there is reason to believe that many landlords, or proprietors of ground, do not advert to the gain of improving such wastes, it may be proper to state it, and to shew that in no other way can money be laid out to such advantage. Whenever it is laid out with judgment, as it always may and ought, the risk is less and the gain greater, it is said, than in manufactures or in commerce. The improver of land is, in the first place, free of all hazard; and in the next place, may be supposed, in general, to gain at least twelve or twenty *per cent.* upon his outlays. The average expence of removing the wetness or improving waste ground is commonly estimated, it is said, to be under three pounds the acre. Now if by these three pounds, land worth only from one shilling to three shillings is raised to fifteen or twenty shillings, the improver has at the lowest rate twelve *per cent.* for his money; or, in other words, by laying out three pounds, he adds fifteen pounds to his stock, as every shilling *per annum* which the acre is improved, is worth at least twenty-five years' purchase. Inclosing and manuring are not reckoned, as lands already in tillage need these ameliorations as well as those that are yet uncultivated. The only expence peculiar to the improvement of waste lands is, it is said, that of draining and reducing the surface to an arable state; and this, it is believed, was stated fully high, as the value of the improvement is probably stated too low. At least this is generally estimated higher, it is said, wherever it has taken place, as might be shewn in numberless instances throughout the kingdom.

In speaking of the same district, the writer farther observes, that it is often said that the soil and climate are more adapted for producing grass than corn, but the truth is, that the soil and climate of the greater part of it are well suited for either; and that wherever toil and skill are exerted in raising either, they are sure of being well rewarded. But supposing grass should be the great object, ought we not, it is asked, to put more of the land there in a capacity for raising it? The meadows there are bad, but we may, says the writer, mend them; they are few, but we may add to them, and almost to any degree we please, and create both pasture for the summer and provender for the winter. By such improvement of our waste lands, the writer says, and by the introduction of green crops, it is possible enough that in half a century some parts of this district might be made to rear more than double the black cattle or sheep that are reared at present. It is impossible to say what the quantity of waste land in this district, it is said, if improved, might one day be made to produce. It is certain that much of it would be found to be more productive than a great part of what is in tillage at present.

Profitable, however, as this business would entirely turn out, both to the individual and to the public, it is to be regretted, the writer thinks, that they who are able are not often disposed to attempt it. Instead of this, they choose, it is said, to buy more, and to enlarge their quantity of wilderness, rather than to improve what they already have. If they would duly weigh these two different plans, they would probably, it is thought, make a different choice. For it is indeed a common observation in this district, it is said, that proprietors seldom make much of farming or improving land.

A statement in the report on the agriculture of the county of Montgomery in North Wales, however, shews that the advantages of improving waste lands is much greater than is suggested in the above detail, considerable as it may appear. It is there said, that Mr. Corbet now draws fifty *per cent. per annum* for the money laid out in improving his peaty or turbary lands; which is the same as buying an estate at two years' purchase. And that were it not for some particular expences attending the inclosing and defending of it, as those of embanking, the profit instead of this would be above one hundred pounds *per cent. per annum*.

In the account of the agriculture of the northern counties, it is stated too, that a spirited farmer there, who many years ago took in lease a tract of fourteen hundred acres of waste land, finds some of the worst of them now very cheap at forty shillings each even in pasture; that one hundred of them are worth more than the whole farm when he took it; and that, though formerly covered with heath, and in a high unsheltered situation, the parts improved were brought, in one or two years, at a moderate expence, to produce as abundant pastures as any near the banks of the Clyde.

It is therefore conceived, by the writer of the report noticed above, that in every view the improvement of waste lands is a gainful business to the owner or undertaker of it. That it is found to be so even in this part of the county, though often so charged, as that the improvement upon an acre of land has from five to ten shillings a year of tithes and poor rates. This, it is said, of itself, would be no small gain in some cases, but which is had there, the writer says, over and above that in the case of their neighbours. It is evident, therefore, it is supposed, that he who is able should lose no time in improving his waste land; and that he who cannot do it otherwise, would find it his interest rather to sell the one half in order to improve the other, than that the work should be left undone. When a proprietor is not disposed, it is said, to improve his waste grounds himself, he ought

ought to give the most liberal encouragement to tenants and the labouring poor to do it for him. The foundation of the encouragement, however, it is thought, should there be certainly a long lease to poor, honest, and industrious labourers; with a small allowance to build a house, and to help them to live until they can raise food to support themselves; after which they should pay interest for the money, and a small rent for the ground. Proprietors, &c. should indeed, it is thought, give any encouragement short of their own loss, rather than allow such lands to lie any longer as they are. It may be noticed here too, that in improving these sorts of land, the open drains or ditches may often be made to serve as fences; so that the expence of inclosing may be saved, which will contribute greatly to the advantage of this sort of improvement.

It is evident, from what has been advanced, that there are different sorts of waste land, which must of necessity require different methods of practical management and working to bring them into a proper state of cultivation, and consequently demand more or less expence in making the improvement which is necessary.

Such lands may, however, for the most part, be arranged and considered under the three general heads stated below.

1. Elevated barren lands, covered with different sorts of coarse plants.

2. Low lands of the swampy, boggy, morassy, and other such watery kinds, infested with various descriptions of coarse vegetable productions.

3. Peaty, mossy, turfy, and other such lands, of which there are many different kinds.

Under each of these heads a great many varieties will obviously be met with in the practice of improving them, which are to be constantly kept in view and fully regarded, in order to effect the business in the most easy, cheap, and effectual manner.

First Division of Waste Land.—This comprehends all the varieties and denominations of moory, heathy, mountain, down, and other such lands, however diversified and changed by the particular circumstances of quality, situation, coarse herbage, and other such matters.

In regard to the nature of the soil, and the means of improving it where the ground is covered with fern, heath, furze, and other similar plants, the remarks of Mr. Phillips, a writer on the improvement of waste lands in North Wales, are highly interesting and useful. In speaking of the improving of them there when of the barren mountain kind, and covered with furze and fern, it is said that the thin layer of soil or mould upon these lands seems to have been created and formed by the annual decay and decomposition of portions of the gorse, which is a plant admirably calculated to produce, and afterwards to detain, in spite of rains and storms, the vegetable earth, afforded by such means, upon these steep declivities. Around each bush of the gorse is always found, it is said, a heap, more or less high, of excellent mould or soil; and so completely do the prickles of this plant defend the grasses that grow among it from the attacks of sheep, that the earth produced by the successive decay of vegetable matter constantly accumulates, and renders land, that a few centuries ago would probably have been unproductive, proper for the growth of corn. It is impossible, it is said, to traverse the mountains there, without observing how wisely these things are contrived by Him who provides for us all. The highest mountains of North Wales, where the rock does not every where appear, are clothed with heath. As ages roll by, the soil or earth, produced by the annual decay of portions of the heath, becomes fit to produce gorse. If the water have a ready fall, and the land be dry, this plant appears in abundance on the most exposed sides of such mountains. Where soil or earth has accumulated in sufficient quantities, the next protector and fertilizer of the mountain is fern. Wherever this plant flourishes, still richer quantities of vegetable earth or mould are, it is said, every year added to the surface soil; and the ground is rapidly prepared for the plough.

The nature, situation, circumstances, and some other points, in respect to the ground, must, in these cases, constantly regulate the modes of clearing the surface, dividing, inclosing, and laying out the lands, as well as the buildings that may be necessary, and direct the kind and extent of the different operations which are afterwards the best and most proper and advantageous to be established and carried on in the improvement of it. Where the land is thin, too much ploughing is mostly, however, to be avoided, though in other circumstances it may, for the most part, be used freely, especially where any sort of suitable ameliorating substances are at hand ready to be applied.

It is stated that a great deal of moorish land, which is covered sometimes with heath, and sometimes with bent grass and *sprots*, is met with in the district of Argyle, in Scotland, and probably prevails in other northern counties; and that as this sort of land there has commonly a good descent, and rests upon gravel at no great distance from the surface, which is generally a black earth of the peat kind, it may be cultivated with the plough at no great expence. In which case, it is directed that it should first be ploughed in summer, in narrow ridges; and soon after either cross-ploughed, or well broken down in some other manner, as by spades, where it can be done. It should then be covered with lime, or some other proper manure, receive a gentle harrowing, and lie in that state until it get the seed-furrow in the spring. It is found that lime is peculiarly suited to heathy and new land, as, by its caustic quality, it converts these and other vegetable matters into fine mould. The effect of lime upon new land is much greater than upon old. The summer's heat, the winter's frost, and the fermentation caused by the manure, will, in most cases, make it mellow and manageable enough by that time. If, in any case, it should not, it is best, it is said, to let it have another summer ploughing, and to let it lie until the next year, when the crop will be so much the better as to pay for the delay. After the ground is seeded and harrowed, the plough should be run lightly through all the ridge furrows, in order to carry off superfluous moisture, and keep the ridges dry. With the second crop, it should mostly be laid down with grass-seeds for pasture, and the furrows be well cleaned. If the ground be of a good staple, three crops may, however, be taken, provided the middle one be turnips, with dung. It is said in the twelfth volume of the "Statistical Account of Scotland," that in this way Mr. Barclay, of Ury, has improved three hundred acres of barren land of this sort. This, after the lime given to the first crop, will leave the land in better heart, it is thought, than if only two white crops were taken simply with the lime.

In the above district, the improvement of waste lands of this description is so cheap a purchase, it is said, that even tenants upon a nineteen years' lease, having access to lime, might pursue it to great advantage. A few of them do so, and more, it is expected, will follow their example. Some in the parish of South-end, who belong to the duke of Argyle, have done much of late years in this way, by which their farms and their profits are enlarged, and the face of the district beautified. But the greatest improvement of this kind that has yet taken place there, is that by the late sheriff Campbell, of Stonefield, who rescued mostly from the

the ftate of barren heath a large farm of many hundred acres, which now of itfelf would be no fmall eftate. And yet it may be faid, the writer obferves, that this vaft improvement coft him nothing; for he ufed to fay that the work always defrayed its own expence. It was befides the means and afforded the pleafure of giving employment to a great number of labouring poor, and of doing much good to all around in different ways, but efpecially by furnifhing feed-corn, which is found to do the beft when taken from new lands, a confideration that fhould more powerfully recommend the improvement of thefe forts of land.

In the improvement of this fort of wafte land, where the heath and other coarfe plants on the furface are confiderable, it is the practice with fome to apply lime in large proportions fome time before the ground is to be broken up, as it is found to have great power and effect in deftroying fuch coarfe matters, and in preparing the fuperficial parts of the foil and ground for the operation of the plough and the action of other tools, and of bringing it into the neceffary cultivation. It is a mode which is thought to fucceed well, and to be highly ufeful and advantageous in many fuch cafes.

A large part of an extenfive tract of barren heath of no great value near Cardiff, in South Wales, has not long ago been improved to vaft benefit at a moderate expence, by breaft-ploughing, or paring and burning the furface, carefully fpreading and turning in the afhes in a light manner, mixing them well with the foil by dragging and harrowing, and then applying lime in not too large a quantity, cropping with wheat, turnips, or fome other more fuitable crops. In fome inftances, the lime was mixed with the afhes to better advantage. This, it is afferted, is the cheapeft and moft effectual method of bringing fuch fort of wafte land into a ftate of cultivation and improvement.

Though objections have been made to the cultivating of wheat in the firft inftance, in fuch cafes, it would appear, it is faid, to be the moft profitable mode of proceeding. This crop fhould be followed by turnips, or by oats with raygrafs and red clover, but the former is to be greatly preferred in general, efpecially if the neceffary quantity of fuitable manure can be procured in a ready manner; when barley with feeds may be tried in fucceffion to the turnips, particularly where they fucceed in fuch a manner as to keep fheep a fufficient length of time on the field. The courfe of the crops will then run thus: wheat, the ftubble carefully turned down in the autumn, then turnips, and thefe followed by barley or oats, with ray-grafs and red clover. The firft crop of thefe graffes grazed by fheep, or other forts of live-ftock, as moft convenient. Land thus managed, when broken up a fecond time, will foon become, without doubt, it is fuppofed, nearly equal to moft other land in the vicinity of it.

It may be neceffary in many cafes, and on many accounts, to vary the firft crop. In fome it may be moft ufeful and proper to begin with turnips; in others with oats and feeds, or with the former only. In lands where mucilage appeared deficient, buck-wheat, turned in, has been tried with great fuccefs, efpecially when afterwards mixed with lime and dung. But the above method of beginning with wheat was found the beft in all cafes where circumftances would permit it. Wheat, when the ground is properly prepared, will always, it is thought, beft repay the expence of fuch preparation; and green leguminous crops, eaten off by fheep or cattle, will afterwards improve the land confiderably, even without other means, which fhould, however, never be neglected where the expence of providing them is moderate. See a tract on the cultivation of wafte land in the above diftrict of Wales, by Col. Capper.

Heath land, where the ftaple is very thin before fmall ftones and gravel are reached, may be improved in fomewhat the fame way in fome cafes; and after the furface materials have been reduced and fpread out, by nine-fhare ploughing it, and fowing it with grafs-feeds well harrowed in. By this fimple method, the fward foon becomes fweet, good, and productive, the heath that originally covered the ground foon difappearing. Waftes that are naturally poor, thin, and barren, fhould never, or but in few cafes, have corn attempted to be raifed upon them in the firft inftance. Heath lands of this fort intended for fheepwalks may be improved by breaft-ploughing, burning, and fpreading out the afhes upon a certain proportion of them every year; half of fuch portion being directly prepared for early turnips; the other half for the fame crop in the fpring. The turnips on the firft part, when fed off on the land by fheep, fhould have the ground they occupied fown after being prepared early in the fpring with tares, in the quantity of three bufhels to the acre, with a few oats; thefe to be fed off with fheep alfo, then fowing turnips again for the fpring, which being fed off as before, the land is to be fown with oats and white clover feeds, eight pounds to the acre, with a bufhel of good hay-feeds. The clover not to be in any way ftocked, after the oats are cut, until the fpring. This land, by being hurdled off, where practicable, and fed with fheep for two or three years, will, it is faid, become an excellent fward, and form a great improvement, affording the improver vaft profit in the increafe of the fheep it can fupport.

There are other modes of bringing wafte lands of thefe different kinds into cultivation, as by planting potatoes in the ridge and other methods, which is well fuited to the means of improving fmall portions by the labouring poor, in many inftances, as they often produce good abundant crops, and render the lands foon fit for other purpofes, without fcarcely any expence being incurred.

The fowing of the feeds of leguminous plants among thofe of the grafs kind, too, has been found not only to increafe the herbage much, but to greatly ameliorate the earth of the land in different cafes. See HEATH, MOOR, WOULD, &c. Alfo PARING and BURNING.

Planting thefe forts of waftes with proper kinds of trees may alfo anfwer well in many cafes, and afford great advantage to the owners. See PLANTING.

Second Divifion of Wafte Land.—This comprifes all the forts and varieties of foft, boggy, and watery land that are formed by the depofition of different rich earthy or other fuch matters; and is, in many cafes, a collection of the rich mud and fediment which is wafhed down from the higher grounds, fo mixed with the recrements of different decayed vegetables of its own growth, and fo over-charged with ftagnant water, that no fort of animal can fcarcely pafs upon it. It is a fort of wafte land that is, for the moft part, more difficult of improvement than heathy moor, or any of the kinds included in the firft divifion, but which will moftly pay better for the expence when it has been accomplifhed than any of them. It is indeed a fort of land that, when well freed of its wetnefs, is the richeft and moft productive of any; nor is the clearing of it of its water in many cafes fo difficult as may at firft be fuppofed. Sometimes the water which produces the mifchief comes from higher grounds, fo that it may be eafily intercepted, and afterwards be made to ferve it, in the way of manure, by being thrown over the furface of it. In other cafes, the water is afforded by internal fprings, which are eafily difcovered, when the land has got an outlet on the lower fide of it, to which the water thus produced can be conducted

by

by open cuts as the mud-earthy material subsides. It may then be drawn off in the usual way, and the land converted to valuable pasture or corn crops, as may be the most suitable and proper.

In this manner, and by the application of proper substances of different kinds on the surface when necessary, many considerable tracts of such sorts of waste land in different parts of the kingdom have, within these late years, been brought into an excellent state of cultivation for the production of corn as well as grass. And besides such advantages, the removal of the stagnant wetness in the lands, in many instances, is of much benefit in promoting the healthiness of the neighbourhoods, by removing the cold and putrid exhalations that proceed from them.

The writer of the tract already alluded to remarks, that the improvement of boggy ground of this sort, in his trials, required more attention, and likewise more expence, to bring it into cultivation, than that of the first division. That in five or six fields, under the management then pointed out and practised, there were small spots of this kind of land, arising from internal wetness on the breasts of the opposite hills, which had been long choaked up, and made swamps of a temporary nature some distance around them; but which have been removed by tapping and forming surface cuts from them, to conduct the superfluous internal and the top water, by the side ditches, to the main cuts, and in some particular instances by strong covered or open deep cuts to the same channels or passages. Since this method has been had recourse to, these fields have, it is said, been sown with wheat, and have borne very excellent crops. At the bottom of the hills on the different sides runs a small brook, it is observed, which has been converted into one of the main passages for taking away the wetness of the whole of the waste: on each side of the brook, the earth has been gradually washed down from the adjacent hills, and a quantity of black mould deposited from it, to the depth of about two feet and a half, and in some places three feet: underneath this soil or mould is in general a fine white sand upon a gravel, but in some places the mouldy material only covers a common peat earthy matter. Various trials, it is said, have been made in bringing these different soils or lands into cultivation: with a mixture of lime, a tolerable crop of wheat has been obtained, even from the peat earth part; and on the other, by the same means, abundant crops of oats have been had. It is intended to try if cabbages, by the help of lime and dung in mixture, will thrive in these bottoms. By such means, it is not doubted, but that in the course of a few years these bottom parts will throw up abundant crops of excellent grass, which, in many places, indeed already begins, it is said, to appear. One half of these boggy bottoms was capable of being ploughed the first year after they had been freed from wetness; the other part was either sown with oats after being dug over, or planted with proper aquatic trees, such as withys and others.

But for wastes of this nature, where there is much coarse, rushy herbage on the surface, and they are considerably dry, the method advised below is suggested as very beneficial and proper. It is, in the months of April and May to pare and burn the surface; and after the matters thus produced are spread equally over it, the ground to be turned over with a very ebb furrow, and at the proper season to be sown with turnips in the broadcast manner. From the almost entire absence of root-weeds, in consequence of the burning, the crop will require little care in dressing by the hoe. The turnips are to be consumed upon the ground, by folding sheep upon it by means of flakes or hurdles. As soon as the land is cleared of the turnips, it is to be ploughed with a good furrow, and to remain in that state until the season for sowing the same crop again arrives. If well worked, and laid into ridges or stitches of the usual breadth of two feet and a half, the dung produced by the sheep that consumed the first turnip crop will render the land capable of giving a superior crop of the same kind the second season. This second crop, like the first, is to be consumed by folding sheep on the land in the same manner; which being finished, the land is to be ploughed and laid into ridges for a corn crop, which is to be either barley or oats, as the nature of the soil and situation of the lands may be. If rich and well sheltered, they should be cropped with barley; if otherwise, with oats; in either case to be sown off with grass-seeds for pasture. It is thought that under this process of management the smallest possible expence is incurred, and that the lands, at the end of three seasons only, are thrown into pasture in high condition, while in the course of the process one valuable corn crop, and one good crop of turnips, have been afforded, together with a less valuable one of the same sort; which last, however, may be sufficient to defray all the expence of tillage attending it, over and above that of reducing the coarse surface. The expence of preparing for the second turnip crop, and for the corn crop, will amount to no more than the price of ordinary light tillage; and the lands, from being brought into the state of grass in high condition, will not only afford abundant profitable pasture, but at the same time be ready, when broken up at a future period, to yield full crops of corn.

In low wet bottoms, another experienced improver of waste lands states too, that the most beneficial mode that has been attempted is, to pare and burn for the same crop to be eaten off by sheep; then to sow oats, and afterwards to lay on five chaldrons of lime to the acre as a preparative for another crop of turnips to be eaten by sheep as before; after which to sow oats, with seeds in the quantity of sixteen pounds of white clover, five pounds of rib-grass, and a quarter of good hay-seeds to the acre. Land so managed, it is said, will carry considerably more stock than it did in its original state. If the water has been completely removed, these seeds may be broken up at the end of two years, or as soon as they appear to decline in productiveness, for wheat, and be put into the four-shift husbandry, namely, turnips after wheat, to be succeeded by barley, clover, turnips, and wheat again. Until the land becomes tired of red clover, there cannot, it is supposed, be a more judicious method adopted for such waste lands than this. When it becomes tired with the red clover, which it will mostly be after two successive rounds, either beans, peas, or seeds, may be substituted. The two former are ameliorating crops, and will be found beneficial where such wastes are of a strong quality of soil, particularly the former, where the land is strong enough for beans. The best substitute for red clover, in such cases, is small seeds for two years, which throws it from the four into the five-shift system.

There are some other methods of improving and bringing these sorts of wastes into cultivation, but which will be seen under their proper heads. See Bog, Swamp, Morass, &c. Also Spring-*Draining*, and Salt-*Marsh*.

Planting with willows and oziers may often be highly profitable in such lands.

Third Division of Waste Land.—This includes all sorts of peaty or mossy lands, from those of the smallest depths to those of the greatest, however different they may be in their qualities, textures, and other circumstances. As they vary very greatly in all these respects, as well as in some others, and in the quantities of moisture or wetness which they contain, it is obvious that there must be great diversity

in the means and methods of cultivating and bringing them into a ſtate of improvement. As there is almoſt always a degree of wetneſs in them, which is unfriendly to the culture and growth of all or moſt ſorts of plants which are objects of the farmer's attention, it is moſtly neceſſary, but eſpecially in thoſe of the deeper kinds, to free them as much as poſſible from the exceſs of moiſtneſs which is preſent, as a firſt ſtep towards their improvement. This is effected in different ways by different improvers of waſtes of this nature, as will be ſeen below. After which the ſurface is to be attended to and rendered as even as may be by ſome proper means, as the nature of it may direct. It is then to be conſolidated and rendered more compact by the application of different ſorts of weighty ſubſtances of the earthy and other kinds, and by all other means by which it can be promoted. This is particularly neceſſary where ſuch waſtes are of a fungous open quality, and may be effected by any ſort of materials of the above kinds which are in quantity and at hand. In different caſes, ſand, clay, marle, and other ſuch matters, may be met with under ſuch waſte lands, and anſwer the purpoſe very effectually at but little expence.

There are improvers of waſtes of this ſort too, eſpecially where they are of the leſs deep kind, who pare and burn the ſurface after the land has been well freed from ſuperfluous water, and by means of the aſhes often procure tolerable crops of the corn kind, ſpeedily reducing the ſurface into good order.

It has been obſerved, that the great point in reducing waſtes of this kind to corn lands is, in the firſt place, to lay them to dry ſo as to favour vegetation, but not ſo dry as to deprive the plants as crops of the neceſſary moiſture. This ſort of medium is, therefore, to be carefully attended to; as the value of ſuch lands is not unfrequently diminiſhed by the laſt as well as the firſt of theſe cauſes.

This ſort of waſte is of ſuch a porous and open quality, that if deprived entirely of its natural moiſture, it will, it is ſaid, admit the drought too greatly for the dews to reach.

Waſte land of this kind, ſeveral feet deep, is ſaid to be made capable of carrying natural clover, and other fine graſſes, in ſome caſes, by no other means than removing the wetneſs, ſmoothing the ſurface, and giving a good covering of ditch ſcourings, and the mud ſcrapings of the ſides of the roads.

In ſome caſes of waſtes of this kind reſting upon fine clayey or ſtrong loamy bottoms, they are floated away, in caſe a ſtream ſufficiently ſtrong can be procured for the purpoſe, in the view of the rich ſoil underneath being reached and brought into cultivation. This proceſs and practice were probably firſt ſuggeſted and had recourſe to by the late ingenious and intelligent lord Kaimes, and moſt ſucceſsfully and extenſively followed out by his ſon and ſucceſſor, in the improving of a very large tract of low waſte of this ſort in the northern part of the kingdom; which is now made to ſupport numerous families, from being wholly barren and unproductive before.

In other caſes of a ſimilar nature, the moſſy material is not, it is ſaid, floated down by a ſtream of water, but only improved upon the ſurface; which is done by cutting a large canal or paſſage on that ſide the waſte next the fall, which is intended to convey the water from the field or land. Smaller ditches are then caſt, which form the field or land into ridges, which are made of more or leſs breadth, as the waſte may happen to be more or leſs ſolid, but all terminating in the great cut or paſſage. The land of the field is next turned over by digging it, and where potatoes are to be the firſt crop, they are planted in the lazy bed mode acroſs the ridges; but in caſe the firſt crop is to be grain, the earth or ſoil of the ridges is turned over the lengthways of them, or in the direction of the ſmaller cuts or openings.

It is thought by the writer of the corrected Report of the Agriculture of the County of Inverneſs, in Scotland, that of all the different methods practiſed for overcoming this ſort of waſte, and for procuring a firſt crop, none appears to be ſo ſucceſsful as potatoes. The mould or ſoil expands ſo eaſily, it is ſaid, that the root gets room to ſwell and attain its full ſize. The ſtem and leaves of the plant retain the dew better than any culmiferous plant; by which means more nouriſhment is procured, in caſe the ſoil and ſeaſon be dry, and the decompoſition of the cloddy earth is promoted: while on the other hand, if the field or land be rather too much overcharged with water, the alleys or openings along the ſides of the beds help to draw away what might prove injurious; and laſtly, the planting and covering, with the hoeing and digging up of the crop, work the ground more perfectly into the mouldy ſtate.

It is noticed, that whatever may have been the original colour and texture of this ſort of land, it, by being wrought for a few years, acquires the appearance and ſome of the qualities of loam. It, however, takes a long time, if ever it can poſſeſs the ſtrength of it, ſo as to bear a frequent return to white crops; but by ſuitable judicious changes of turnips, potatoes, and graſs, raiſed alternately with white crops, it may, it is thought, be made to continue any length of time in a productive ſtate.

Some ſuppoſe this kind of waſte land is beſt adapted to the raiſing of graſs; and that, for that purpoſe, more than of growing corn, it ſhould moſtly be improved and brought into cultivation. Clover will grow in it, if it be ſufficiently dry, it is ſaid; and rye-graſs ſtill better, as it is leſs delicate. But that the ſort of graſs that ſuits it beſt, is the meadow ſoft-graſs or Yorkſhire white. This grows cloſe and quickly, keeps the ground well, and is equally fit for paſture and for hay.

In Lancaſhire, where extenſive improvements of this ſort of waſtes have lately been effected, and where vaſt tracts ſtill remain to be improved, the methods of practice in bringing them into ſuch ſtates are in ſome meaſure theſe. In the ſouthern part of the diſtrict they are firſt divided into ſuitable fields or portions by large open ditches, ſo cut and formed as to be prevented from being forced in by the preſſure of the water that is contained in the land, by which they are freed of a conſiderable part of it. They have then ſmaller covered drains formed in them in proper directions for taking off more of the ſuperfluous wetneſs that may be preſent, the diſtances of which are regulated by the nature of the waſte, and the quantity of moiſture that may be in it. After this the ſurface is levelled and brought into order by taking off the coarſe, hilly, uneven parts, and putting them into large heaps to be conſumed in a ſlow ſmothering manner, ſpreading the reduced materials evenly out over the whole, adding a good full covering of clay, marle, or fine lime-ſtone gravel, ſome of which are moſtly found under the lands.

When they have remained for ſome time in this ſituation, they are broken up by a proper plough contrived and prepared for the purpoſe, by having the irons in a perfectly ſharp condition, and by the coulter being ſo fixed as to operate without reſiſtance. The horſes employed as the team in the firſt breaking up, and ſometimes afterwards, are under the neceſſity of having pattens put upon their hind feet, as this ſaves the labour of men, except in particular inſtances of very ſoft lands of this ſort. The cropping is ſuch as has been

been already ſeen, but the great objects as firſt crops are oats, turnips, potatoes, and a few others. By theſe means, this kind of waſte is there frequently ſoon got into a profitable ſtate.

The tracts of waſte of this deſcription in the middle part of this diſtrict are chiefly, eſpecially where in the wild ſtate, brought into the improved condition, by paring and burning the ſurface, the application of marle or lime, and the breaking up for oats. The marle is moſtly laid on before the other operations take place. Some think this practice anſwers well, but much remains to be done, and better modes are to be uſed for the purpoſe.

In the northern part of the ſame diſtrict, where great improvements of this nature have been well accompliſhed in deep unfavourable caſes, the moſt improved practice is now, after a proper quantity of large open cuts have been made for taking away the ſtagnant water, and for promoting the dryneſs and ſolidity of the land, to begin with effectual cutting of drains in the land at nine feet diſtance from each other, made to the width of two feet and the depth of three, below which a deep opening is formed by a long pointed ſpade, which is left open, but the whole ſpace above it covered and filled in. When the ſurface is levelled where neceſſary, and the land wholly ploughed over by beginning on the ſides of the drains, and laying the furrow-ſlices well over them, it is well harrowed lengthways of the ridges. Then in winter, in time of froſt, if it can be done, ſand or clay is applied in the quantity of three or four thouſand ſingle-horſe cart-loads to the cuſtomary acre, and ſpread out evenly over the ſurface, in which ſtate it and the land remain until the beginning of the ſpring. It is then harrowed well in, and the land ploughed and ſown with oats. In the next ſpring the land is ſet with potatoes in drills four feet apart, uſing a little littery dung, and they are kept repeatedly well earthed up. As ſoon as the potatoes are taken off, wheat and rye are put in upon one ploughing, and good crops afforded.

In the winter afterwards theſe ſtubbles are ploughed down, and in the enſuing ſpring a compoſt of ſome kind of heavy material with lime laid on, and the land ſown with barley, which affords good crops.

After the barley, turnips are often had with a ſlight manuring; and the land then laid down with oats, or wheat and ſeeds.

Leſs red clover than formerly is now ſown, but the quantities of trefoil, white clover, and rib-graſs, are increaſed.

This method of improving ſuch land is found the beſt, and by far the cheapeſt, after great experience, by a very intelligent improver of this kind of waſte land in that part of the county.

The large open ditches and water-courſes firſt made in theſe lands are now found beſt formed there with long ſlopes on one ſide, ſo as to have the appearance of a ſort of ſunk fences, by which means the whole ſlopes are rendered capable of being covered with ſome heavy earthy ſubſtance, and of being then ſown with graſs-ſeeds, ſo as to afford a ſward to the very water's edge; and thereby to admit ſtock to lie more ſheltered and warm, as well as to afford more paſturage.

The practice of paring and burning is here now never had recourſe to in bringing this ſort of waſte land into a ſtate of improvement. The bringing of it into ſuch a ſtate is, it is thought, a proceſs or buſineſs that ſhould proceed in a very gradual and regular manner, as there is much loſs and inconvenience in puſhing it on too rapidly. In all ſuch attempts, as froſt is conſidered by many as having great power and effect in reducing the particles of ſuch ſoils into a mouldy mellow condition, they ſhould be expoſed as greatly as poſſible to its action and influence at the time when it takes place, by being laid up for the purpoſe. See the Corrected Report on the Agriculture of the County of Lancaſter.

In different diſtricts of the more northern parts of the kingdom, immenſe tracts of waſtes of this kind are almoſt every where to be met with. In that of the county of Argyle, according to the writer of the account of the ſtate of its agriculture, they are to be found in every pariſh; and though capable of cultivation and improvement are wholly uſeleſs, and of little or no value. They have different depths, as from two or three to eight or ten feet, and differ in ſize, ſo that ſome of them are to be eſtimated not by the number of acres, but of ſquare miles. They have in ſome caſes every advantage of ſituation for manure and markets, vaſt quantities of lime-ſtone being near on one ſide, and vaſt maſſes of ſand and ſea-ware on the other; beſides many other facilities and conveniences of improvement. There can therefore be no great difficulty in bringing them into ſuch a ſtate, when once it is ſet about, the means of doing which have been well and ably pointed out, as applicable in different caſes, by the writer. It is evident, from what has been already done there, that this ſort of waſte, though of no utility in its uſual ſtate, may be turned to very great account, in many inſtances, by cultivation. See the agricultural report of the above county.

It has been ſuggeſted, that by rendering the extenſive turf boggy waſtes of this country, Scotland, and Ireland fertile and productive, a very great addition is capable of being made to the wealth of the nation, and to the means of ſubſiſtence of its population. See Moss, PEAT, TURF, &c.

WASTE *Matters, Uſeful as Manure*, the refuſe materials produced in various ways and by different operations; ſuch are, the blood and offal matters of the ſlaughter-houſe, the refuſe of the ſkin and leather dreſſer, the offals of the tan-yard and the glue-maker, the waſte fat oily matters of ſome large-fiſhes, (ſee WHALE-*Blubber*,) the waſte of ſoap-makers. See ASHES, SOAPER'*s Aſhes*, and WOOD-*Aſhes*.

WASTE *of the Foreſt*, is, properly, where a man cuts down his own woods within the foreſt, without licence of the king or lord chief juſtice in eyre.

Year, Day, and *Waſte*. See YEAR, *Day and Waſte*.

WASTE *of a Ship*. See WAIST.

WASTE-*Board*. See WASH-*Board*.

WASTE-*Cloths*, in a *Ship of War*. See FIGHTS.

WASTE-*Trees*, in a *Ship*, are thoſe timbers which lie in her waſte, or waiſt.

WASTE-*Gates*, in *Canals*, are ſluices to let off ſpare water from a canal, mill-dam, &c.

WASTE-*Weir*, an over-fall or weir for ſuperfluous water in a canal.

WASTEL BREAD, *Waſtelli*. This word, which has puzzled biſhop Lowth, in his Life of Wykeham, &c. appears, by the Conſuetudines Glaſtonienſes apud Will. Malmſ. to have been a kind of fine bread or rolls, which were ſerved up in our ancient communities when the uſe of the waſſail-bowl was allowed.

WASTERAHS, in *Geography*. See WESTERAHS.

WASTERO, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 63° 22′. E. long. 21° 34′.

WASTORELS, or WASTRELS, in *Rural Economy*, a term applied to any ſort of waſte or outcaſt ſubſtances or matters, ſuch as bricks, tiles, ſlates, and many other ſuch like things, when badly formed, or of a bad kind. The young lambs, pigs, and calves, ſold to the butchers, which are improper for keeping as ſtock, are ſometimes alſo called by this name.

WASTORS, in our *Statutes*, a kind of thieves so called, and mentioned among robbers, draw-latches, &c.

WASUNGEN, in *Geography*, a town of Germany, in the county of Henneberg, on the Werra; 3 miles N. of Meinungen. N. lat. 50° 41'. E. long. 10° 38'.

WATAGUAKI, a river of Labrador, which runs into the gulf of St. Lawrence, N. lat. 50° 12'. W. long. 60° 5'.

WATAGUAKI *Isles*, a cluster of small islands in the gulf of St. Lawrence, near the coast of Labrador.

WATARA, a town of Hindoostan, in the circar of Cicacole; 14 miles S. of Cossimcotta.

WATARAS, a town of Africa, in the country of Agades; 50 miles N. of Agades.

WATAS, a town of Sweden, in West Bothnia, on the Calix; 50 miles N.W. of Tornea.

WATAUGA, a river which rises in North Carolina, and runs into the Holston, in Tennessee.

WATCH, GUET, a person posted as a spy in any place, to have an eye to it, and to give notice of what passes.

WATCH is also used for a corps de garde posted at any passage; or for a company of guards who go on the patrole. Some officers are exempted from watch and guard.

In the same sense they say, *night-watch, guet de nuit; watch-word, mot de guet; royal watch*, and *city watch*.

Chevalier du guet is a name given by the French to the officer who commands the royal watch, &c.

WATCH, *Vigilia*, in *Roman Antiquities*, a division of their night; being the fourth part of the space of time between sun-set and sun-rising, and consequently varying according to the season of the year.

In the Roman army, there were night-guards or vigiles, *viz.* four in every manipulus, who kept guard three hours, and were then relieved by four others: so that there were four sets in a night, according to the four watches. The way of setting this nightly guard was by a tally or tessera, with a particular inscription, given from one centurion to another quite through the army, till it came again to the tribune who first delivered it: upon the receipt of this the guard was immediately set. Besides, they had the *circuitio vigilium*, or a visiting of the watch, performed commonly about four times in the night by some of the horse. Upon extraordinary occasions the tribunes and lieutenant-generals, and sometimes the general himself, made these circuits in person, and took a strict view of the watch in every part of the camp.

WATCH, at *Sea*, signifies the space of time in which one division of a ship's crew remains upon deck, to perform the necessary services, whilst the rest are relieved from duty, either when the vessel is under sail, or at anchor. The length of the sea-watch is not the same in the shipping of different nations. It is always kept four hours by our British seamen, if we except the dog-watch between four and eight in the evening, that contains two reliefs, each of which is only two hours on deck. The intent of this is to change the period of the night-watch every twenty-four hours; so that the party watching from eight till twelve in one night, shall watch from midnight till four in the morning on the succeeding one. In France the duration of the watch is extremely different, being in some places six hours, and in others seven or eight; and in Turkey and Barbary it is usually five or six hours.

A ship's company is usually classed into two parties: one of which is called the starboard, and the other the larboard watch. It is, however, occasionally separated into three divisions, as in a road, or in particular voyages.

In a ship of war, the watch is generally commanded by a leiutenant, and in merchant-ships by one of the mates: so that if there are four mates in the latter, there are two in each watch; the first and third being in the larboard, and the second and fourth in the starboard watch: but in the navy, the officers who command the watch usually divide themselves into three parts, in order to lighten their duty. Falconer.

WATCH-*Glasses*, in a *Ship*, are glasses employed to measure the period of the watch, or to divide it into any number of equal parts, as hours, half hours, &c. so that the several stations therein may be regularly kept and relieved, as at the helm, pump, look-out, &c.

To set the watch, in *Sea Language*, is to appoint one division of the crew to enter upon the duty of the watch; as at eight o'clock in the evening.

WATCH, *Death*. See DEATH.

WATCH, in *Horology*, is a portable machine that measures and indicates the successive portions of transient time. This useful piece of mechanism, when planned on the best scientific principles, and executed in the most perfect manner, contains within itself a collection of inventions, that have exercised the skill of the most ingenious mechanists through a succession of three if not four centuries; and when we contemplate the curiously-contrived and nicely-adjusted means by which the never-varying period of our globe's rotation on its axis is divided and subdivided into hours, minutes, and seconds, we need not be surprised that a *Paley* has selected this curious machine as a striking specimen of human ingenuity.

It is a matter of difficult research to ascertain what artist first reduced the portable spring-clock into the size of a watch, which is supposed to have been first effected in Germany; but it is evident that watches had become common in France before the year 1544, in which the corporation of master clock-makers in Paris had a statute enacted, to ensure to themselves the exclusive privilege of making, and of causing to be made, clocks, alarums, and watches, large or small, within the precinct of the said city.

The small clocks and watches, however, which were made antecedently to the time of Huygens and Dr. Hooke, were very imperfect performers, and professed not to subdivide the hour into minutes and seconds; the double lever, and the balance arising out of it, were very imperfect regulators of the motion, produced in the train of wheel-work by the maintaining power, inasmuch as they were under the influence of various opposing agents, such as friction arising from coarse workmanship, the inertia of matter, resistance of the air, &c.; the consequence of which was, that the weight of the moving balance was to be determined by experiments, such as would be a proper counterpoise to the agency of the main-spring on the moving train, and at the commencement of each returning oscillation, a considerable pause took place, which made a part of the measure of time to be indicated. These inconveniences at length were obviated by the introduction of a balance-spring, which became to the balance what gravity is to the pendulum; and the acceleration given to the moving balance during the first half of the oscillation, is thus sufficient to overcome the resistance opposed to its motion during the second half; and when the shape, length, and strength of the regulating spring are duly proportioned, its isochronal performance approaches very nearly to the regularity of the pendulum. The contest for the honour of this useful invention was warmly disputed between Huygens and Dr. Hooke, for several years subsequently to 1658; but if priority of publication can be considered as a proof of priority of invention, the palm is due to our ingenious countryman.

In our articles CHRONOMETER, CLOCK, COMPENSATION-*Balance*,

Balance, DIAL-*Work*, ESCAPEMENT, POWER, *Maintaining*, and REMONTOIR, we have anticipated the consideration of the most material parts of a watch, and have given such a detailed account of most of the varieties that occur in the practical construction of this machine, that little remains to be done in this place, but to descr be an ordinary watch, without reference to its history, scientific principles, compensations, or superior workmanship; all which have been amply discussed, and the constituent parts explained by accurate engravings of the corresponding mechanism. We may, however, comprehend in this article the appendages which have been applied to or actuated by the common watch, for the purpose of either amusement or utility in civil society, such as chimes, alarums, striking-work, and repeating mechanism, most of which operate as a drag upon the works, and are therefore never introduced in chronometers, and seldom in watches of the most perfect construction.

Fig. 1. *Plate* XLIV. of *Horology*, represents the interior works of an ordinary watch with the crown-wheel escapement, as they remain on the pillar-plate when the upper plate of the frame, shewn by *fig.* 5, is unpinned and removed; and *fig.* 2, which is a section of the whole frame and of its contents, shews the connection of all the parts, as though the calliper were in one right line. These two figures, by having the same letters of reference, mutually explain each other. The main-spring, which actuates all the wheels and pinions that are called in one general term the movement, is contained in the circular box *a*, seen in different views in the separate figures 1, 2, and 8, in the last of which its parts are given in their detached state, *viz.* the box; the relaxed spring immediately above, lying in a spiral form; the arbor with its pin, on which the interior end of the spring is hooked; and the lid through which the pivot of the arbor penetrates: this spring is forced into the box by a tool on purpose, when it is strong, and then the exterior end is hooked to a pin in the circular edge of the box, so that if the box is made to turn round while the arbor is held fast, the spring begins to coil at the centre, and is thereby wound close round the arbor, and is by this action said to be *wound up*. The same effect would be produced if the box were held fast, and the arbor only were turned; but in the latter case the chain, which requires to be uncoiled from the spring-box as this spring is wound up, would remain unmoved; it is necessary therefore that the box be turned while the arbor is at rest, which is thus effected: one end of the chain is made fast to the side of the spring-box, and the other to the fusee *b*, after being coiled several times round the circumference of the box; then as the square end of the spring-box arbor is held by the small ratchet and click *c*, seen on the reversed face of the pillar-plate in *fig.* 7, so that it cannot revolve, it is obvious that inserting a key on the square of the fusee-arbor, and turning it in a proper direction, will wind the chain upon the spiral-groove of the fusee, while it is unwound from the box; and during this operation the spring will be coiled up to the centre of the box, or be put into its state of greatest tension for pulling the fusee back again. The rapid motion which the fusee would have in a retrograde direction, when pulled by the whole force of the coiled spring, is prevented by the train of wheel-work and balance thus; the great wheel *d* is not fast to the thick end of the fusee, as appears in the drawings, but carries a click and click-spring 2, as seen in *fig.* 3, while the ratchet-wheel, seen in *fig.* 4, is made fast to the fusee; the consequence of which contrivance is, that while a key applied to the fusee-arbor winds up the watch and fills the fusee-groove with the chain, until the guard driven by it catches the beak at the small end of the fusee; the click in *fig.* 3. slides over the sloping teeth of the ratchet in *fig.* 4, without acting on them, and thus leaves the great wheel *d* at rest, in connection with the pinion *e*, on the centre or minute-wheel arbor; but when the spring acts on the fusee in a contrary direction, the click attached to the great wheel is laid hold of by the teeth of the ratchet, which thus makes it fast to the end of the fusee, so long as the chain is unwinding from the fusee; or, in other words, till the spring wants winding up again, which happens usually once in 28 or 30 hours; but it is commonly wound up once in every 24 hours, more or less. The action of the great wheel *d* on the pinion *e*, is that of a long lever driving a short one; or this wheel may be said to act under a mechanical disadvantage, where an increase of velocity, but a loss of power, is experienced by the pinion; again, on the same central arbor of this pinion *e* is riveted the centre-wheel *f*, which revolves in an exact hour, as we shall see presently, and this wheel drives the pinion *g*, on the arbor of the third wheel *h*, also with a mechanical disadvantage, for the force it imparts to the pinion *i*, on the arbor of the contrate-wheel, is again diminished in the ratio of the diameter of the wheel to that of its pinion; thus, the force of the main-spring is continually diminishing, as it is transmitted through the train, and when the contrate-wheel comes to be actuated, it has just force enough to drive the horizontal pinion on the balance-wheel *l*, so that the alternate impulses given by its teeth to the pallets of the balance-verge are just sufficient to perpetuate the oscillations to the right and left, under all the obstacles of friction, dirt, wear, and the air's resistance. It is a curious fact that this crown-wheel escapement, though the *oldest* that we know of, is still the most in use in common watches, probably from the facility with which it is constructed; for certainly it is more under the influence of the irregularities of the main-spring's force than any other escapement. The properties and action of this escapement have been minutely explained under No. 1. of the article ESCAPEMENT, with reference to *fig.* 6. *Plate* XXXI. of *Horology*, to which explanation and figure therefore we request our reader's attention.

In order that the force applied to the pallets of the verge at each oscillation may not sensibly vary, it was found necessary to equalize, as much as possible, the variable forces of the main-spring in its different states of tension; and the most practicable way of doing this has been found to convert the cylinder on the arbor of the great wheel, which would have been proper for a gravitating body, used as a maintaining power, into a figure of a parabolic form, that is, into a solid, generated by the revolution of a parabola, in order that, as the force of the spring becomes greater by increased tension, its action on the great wheel might be lessened in a similar proportion, by a gradual decrease of the radius of the fusee, round which the chain is wound, to impart the force thus modified. Every separate spring, therefore, has not only its average force proportioned to the balance it is destined to actuate, when diminished by transmission through a given train, but requires its *scale* of varying forces to be nicely counteracted in every degree of tension by the *shape* of the fusee; and this is done by means of a tool, called a fusee adjusting-tool, which is nothing more than a lever with a sliding weight attached to the squared end of the fusee-arbor, as represented in *fig.* 10. *Plate* XXI. of *Horology*; for when the weight on the lever is an exact counterpoise to the force of the main-spring in every part of the successive revolutions of the fusee, as the spring is wound up by the lever instead of a key, then the shape of the fusee is proper, but not otherwise. Hence, whenever a new main-spring is put into a watch, the fusee ought to be adjusted in the

the fusee-engine accordingly as the adjusting-tool determines. The comparative forces of the spring at the two extreme ends of the fusee may be adjusted by the small ratchet *c*, on the back of the pillar-plate in *fig.* 7; but when the spring is put to a suitable degree of tension to act well at both extremities of the fusee, it must not be altered by the ratchet-click, but the intermediate forces must be equalized by a due shape given to the fusee. We have insisted the more on this part of the mechanism being attended to, because, as the *primum mobile*, it is the basis of all the other motions. The number of rounds that the spiral of the parabolic fusee may be cut into, depends on the length of the pillars of the frame, or, which is the same thing, on the shallowness of the watch. The French frequently leave out the fusee, and attempt to equalize the forces of the main-spring by tapering it, and with detached escapements this mode may sometimes answer tolerably, but with the crown-wheel escapement a fusee is indispensable. Again, the number of teeth in the great wheel, and in the centre pinion, depends on the number of rounds in the spiral of the fusee; in a 30 hours watch, with six turns of the fusee, the great wheel must have $\frac{30}{6}$, or 5 times as many teeth as the centre pinion; so that if this has 6 leaves, the wheel must have $5 \times 6 = 30$ teeth; but if 8, then $5 \times 8 = 40$; if the spiral has 7 turns, the great wheel 48, and the pinion 12, then the time of going will be $\frac{48}{12} \times 7 = 28$ hours; also if there be $5\frac{1}{2}$ turns on the fusee, 50 teeth in the wheel, and 10 leaves in the pinion, the period of going will be $27\frac{1}{2}$ hours, or $\frac{50}{10} \times 5\frac{1}{2} = 5 \times 5\frac{1}{2} = 27\frac{1}{2}$; but if 24 hours only were required as the period, with 6 turns and a pinion of 12, the great wheel would be required to have 48. Thus, when an alteration is made in either the pinion, the wheel, or the turns in the fusee, a corresponding variation may be made in the others, to produce the same period of going, but still the centre-wheel revolves once in an hour. In the commonest watches the pinions have only six leaves each, which do not act so well as pinions of higher numbers; but in the best watches, and in all chronometers, the leaves and teeth are more numerous. The pivot-holes, particularly of the verge and escapement-wheel arbor, have jewels for the purpose of diminishing the friction in the best watches; but detached and remontoir escapements are the best correctives of the unequal impulses given through the medium of the train in the different states of its foulness. The potance *m*, and small or counter potance *n*, that hold the pivots of the balance-wheel, are small cocks seen in *fig.* 2. both in their attached and detached states, and are screwed to the top or upper plate within the frame, but the springs, buttons, and joints of the case are not exhibited, as forming no part of the movement. *Fig.* 5. represents the outer face of the upper plate, with the balance *p*, cock *o*, and balance-spring *s*, called the pendulum-spring, from its having the properties of the pendulum; by means of this spring not only is the regulation made steady, but the adjustment for *time* is effected. In every balance-spring there is a certain length, to be taken as the effective length, by which the going of the watch, to which it is applied, is limited to exact performance, and when this length is determined by experiment, a pin is put in the stud that holds the exterior end, as at 4, in *fig.* 5, to prevent its being altered; but as the variation of temperature will alter the momentum of the moving balance, the effect thereby produced is a loss of time, in the rate, in hot weather, and a gain in cold, by an alternate increase and decrease in the dimensions of the balance itself, as well as by some alteration in the spring: to remedy this defect, in an ordinary watch, the contrivance shewn in *fig.* 6. is introduced; the wheel *t* is placed under the graduated circle *r*, seen in *fig.* 5, and a circular rack *u*, *fig.* 6, that holds the curb or slit-piece 5, seen in both figures, is moved by a sliding motion given to it, when a key is applied to the squared arbor of the figured circle, and thus the effective length of the spiral spring is limited by the position of the curb 5; and accordingly as the key is turned forwards or back, towards the words *fast* or *slow*, engraved on the cock, the shortened or lengthened spring alters the rate of going, till the proper length is found, that suits the season in question. In Harrison's time-piece the curb was moved by an expansion-lever of two metals, that acted by means of the change of temperature; but in the best chronometers of more recent date, the compensating levers constitute the three portions into which the rim of the balance is divided, and the adjustment for time, as well as compensation for temperature, are by means of heavy screws, which form a part of the moving balance. In these more perfect machines, the length of the spring, which is now made helical, or cylindrical, is first determined such, that the long and short vibrations are performed in the same time, and this is called the isochronal length, which is not afterwards altered by subsequent adjustments. But of these niceties we have treated more fully under our long article CHRONOMETER. The last portion of the watch, which demands our explanation, is the dial-work, for producing the hours and minutes; this will be easily understood by a reference to figures 2 and 7: when the pinion, called the cannon-pinion, seen near the minute-hand in *fig.* 2, is inserted on the arbor of the hour or centre-wheel, to which it fits rather tight by friction, it revolves therewith in an hour, and receives the minute or long hand on its protruding squared end; then this pinion drives the wheel *x* round a stud on the pillar-plate, and with it a pinion *w* made fast to its centre; which pinion again drives a second wheel *v* round the tube of the cannon-pinion in twelve hours, and to this the hour-hand is attached. This diminution of twelve revolutions from the cannon-pinion to the hour-wheel might be effected by one pinion driving a single wheel of twelve times its number of teeth; but as the motion must be brought back to the centre of the dial again, two more wheels, or a wheel and pinion, are necessary to be introduced, and these are therefore made a part of the train, and no large wheel or small pinion is wanted, for the ratio 12 : 1 may be more conveniently obtained by two factors, *viz.* 4 : 1 and 3 : 1; thus, suppose the cannon-pinion to have 15 leaves, its wheel may have $4 \times 15 = 60$ teeth for wheel *x*, and if wheel *v* be made the same its pinion will be $\frac{60}{3} = 20$, and the train $\frac{60}{15} \times \frac{60}{20} = \frac{360}{30} = \frac{72}{6}$ or $\frac{60}{5} = \frac{12}{1}$ or 12; so that when the pinions are fixed upon for the dial-work, the wheels are readily determined, and *vice versâ*. Under our term CLOCK-*Movement*, we have given three tables, containing the several varieties of the three different portions of a clock-movement, which are equally applicable to a watch-movement, and we presume will be found useful to the practical workman, who is disposed to vary his construction to shew seconds, or for other particular purposes. The following table, somewhat differently arranged, was published by W. Shirt, balance-wheel and fusee-cutter, No. 25, Coleman-street, Bunhill-row, London, with which we will conclude this division of our article.

A TABLE

A TABLE of Trains for Watches, shewing the Number of Turns on the Fusee and Teeth in the Balance-wheel, with the Beats in an Hour, and the Number of Seconds in which the Contrate or Fourth Wheel revolves, for the easy Timing of Watches by the Vibrations of the Pendulum.

9 Teeth in the Balance-Wheel.

Second Wheel 58 6 Third Wheel Pinion Third Wheel 56 6 Contrate Pin. Contrate Wheel 54 6 Balance Pin. Beats 14616 in an Hour Seconds $39\frac{3}{10}$ in which the 4th Wheel revolves	60 8 56 7 80 6 14400 60	60 6 58 6 52 6 15080 $37\frac{1}{4}$	60 6 58 6 56 6 16240 $37\frac{1}{4}$	60 6 60 6 54 6 16200 36	60 6 60 6 60 6 18000 36	64 6 60 6 54 6 17280 $33\frac{3}{4}$	64 8 60 8 80 6 14400 60

11 Teeth in the Balance-Wheel.

Second Wheel 48 6 Third Wheel Pin. Third Wheel 45 6 Contrate Pin. Contrate Wheel 70 6 Balance Pin. Beats 15400 in an Hour Seconds 60 in which the 4th Wheel revolves	54 6 45 6 65 6 16087 $53\frac{1}{3}$	54 6 50 6 60 6 16500 48	56 7 45 6 78 6 17160 60	56 6 54 6 54 6 16632 $42\frac{2}{3}$	56 6 56 6 55 6 17567 $41\frac{1}{4}$

58 6 52 6 52 6 15973 $42\frac{3}{4}$	58 6 54 6 52 6 16588 $41\frac{1}{3}$	58 6 54 6 54 6 17226 $41\frac{1}{3}$	58 6 56 6 54 6 17817 $39\frac{2}{3}$	58 7 56 6 56 6 15879 $54\frac{1}{3}$	60 6 50 6 52 6 15888 43	60 6 52 6 52 6 16520 $41\frac{1}{2}$	60 6 54 6 50 6 16500 40	60 6 54 6 52 6 17160 40	60 6 54 6 54 6 17820 40	60 6 55 6 52 6 17477 39
60 6 56 6 50 6 17111 $38\frac{1}{2}$	60 7 56 6 56 6 16426 40	60 8 56 7 74 6 16280 60	60 8 56 7 78 6 17160 60	60 6 60 6 48 6 17553 36	60 8 60 6 56 6 15400 48	60 7 60 7 60 6 16163 49	62 6 54 6 52 6 17935 $38\frac{1}{4}$	62 7 58 6 52 6 16324 45	63 6 54 6 50 6 17325 38	63 6 56 7 56 6 17248 $42\frac{1}{4}$
64 6 50 6 50 6 16296 $40\frac{1}{2}$	64 6 52 6 52 6 17625 39	65 7 62 7 59 7 15250 $43\frac{3}{4}$	70 8 54 7 68 6 16830 $53\frac{1}{3}$	70 7 63 7 58 7 16408 40	72 8 63 7 54 6 16035 $44\frac{1}{2}$	72 7 64 7 58 7 17142 $38\frac{1}{4}$	80 8 72 8 68 8 16830 40	75 10 72 9 66 8 13200 60	72 9 66 8 60 6 13200 66	72 9 60 8 54 6 11880 60

13 Teeth in the Balance-Wheel.

Second Wheel 48 6 Third Wheel Pin. Third Wheel 45 6 Contrate Pin. Contrate Wheel 66 6 Balance Pin. Beats 17160 in an Hour Seconds 60 in which the 4th Wheel revolves	48 6 45 6 68 6 17680 60	52 6 52 6 52 6 16925 $46\frac{1}{2}$	54 6 50 6 50 6 16274 48	54 6 52 6 48 6 16224 46	54 6 52 6 50 6 16900 46

54 6 52 6 51 6 17238 46	54 6 52 6 52 6 17576 46	55 6 51 6 51 6 17219 $46\frac{1}{4}$	56 7 45 6 66 6 17160 60	56 6 50 6 50 6 16851 $46\frac{1}{2}$	56 6 50 6 51 6 17188 $46\frac{1}{2}$	56 6 52 6 48 6 16824 $44\frac{1}{2}$	56 6 52 6 50 6 17525 $44\frac{1}{2}$	56 6 54 6 49 6 17836 $42\frac{3}{4}$	58 6 48 6 52 6 17425 $46\frac{3}{4}$	58 6 50 6 50 6 17453 $44\frac{2}{3}$
60 6 48 6 48 6 16640 45	60 8 48 6 66 6 17160 60	60 6 50 6 46 6 16611 43	60 6 50 6 48 6 17333 43	60 7 54 6 52 6 17382 $46\frac{1}{3}$	60 6 54 8 60 6 17550 54	60 7 56 7 56 6 16640 $52\frac{1}{2}$	60 8 56 7 66 6 17160 60	60 7 58 7 56 6 17234 $50\frac{2}{3}$	60 8 58 6 56 6 17593 $49\frac{1}{2}$	60 6 60 7 48 6 17828 42
60 8 60 6 54 6 17550 48	60 6 60 7 56 7 17828 42	62 7 56 7 56 6 17194 $50\frac{1}{4}$	63 7 52 6 51 6 17238 $46\frac{1}{4}$	63 7 60 7 60 7 17191 $46\frac{1}{3}$	64 7 52 6 50 6 17168 46	64 7 60 7 60 7 17464 $45\frac{3}{4}$	64 8 60 8 66 6 17160 60	64 8 64 8 72 7 17115 $56\frac{1}{4}$	65 7 62 7 58 7 17717 $43\frac{1}{2}$	70 8 60 7 52 6 16900 48
70 8 66 8 64 7 17160 50	72 8 52 6 52 6 16673 $44\frac{1}{2}$	72 8 70 8 68 8 17403 $52\frac{1}{2}$	74 8 64 8 63 7 17316 $48\frac{2}{3}$	74 8 68 8 68 8 17400 60	75 10 72 9 70 7 15600 60	75 10 72 9 72 9 12480 60	80 10 60 8 60 8 15600 60	96 12 75 10 80 8 15600 60	96 12 75 10 88 8 17160 60	90 10 90 10 90 10 18954 $44\frac{1}{2}$

TABLE *continued.*

15 Teeth in the Balance-Wheel.

Second Wheel 48 6 Third Wheel Pinion Third Wheel 45 6 Contrate Pin. Contrate Wheel 54 6 Balance Pin. Beats 16200 in an Hour Seconds 60 in which the 4th Wheel revolves						48 6 45 6 58 6 17400 60	48 6 45 6 60 6 18000 60	54 6 48 6 46 6 16560 50	54 6 48 6 48 6 17280 50	54 6 48 6 64 8 17280 50
54 6 50 6 48 6 18000 48	56 7 45 6 56 6 16800 60	56 7 45 6 58 6 17400 60	56 7 45 6 60 6 18000 60	56 6 48 6 46 6 17173 48	56 7 60 8 60 6 18000 60	58 6 48 6 46 6 17786 46½	58 6 50 8 58 6 17520 59½	60 8 48 6 58 6 17400 60	60 8 48 6 60 6 18000 60	60 8 56 7 48 6 14400 60
60 8 56 7 56 7 14400 60	60 7 56 7 58 7 17044 52½	60 8 56 7 58 6 17400 60	60 8 56 7 60 6 18000 60	60 8 56 7 60 7 15386 60	60 6 60 8 48 6 18000 48	60 6 60 10 48 6 14400 60	60 6 60 8 56 7 18000 48	60 6 60 10 58 6 17400 60	60 10 60 6 60 6 18000 60	60 6 60 10 64 8 14400 60
60 8 64 8 66 7 16971 60	60 8 64 8 70 7 18000 60	62 8 60 8 60 6 17437 61⅓	63 7 54 7 50 6 17356 51¾	63 7 56 7 56 7 17280 50	64 8 45 6 56 6 16800 60	64 8 60 8 58 6 17400 60	64 8 60 8 60 6 18000 60	64 6 60 10 70 8 16800 56¼	65 7 56 7 56 7 17828 48⅓	70 6 60 10 48 6 16800 51⅓
70 7 60 10 70 7 18000 60	70 8 64 8 50 6 17500 51⅓	70 8 64 8 58 7 17400 51⅓	70 10 65 8 60 6 17062 56¾	72 6 60 10 48 6 17280 50	72 8 64 8 50 6 18000 50	72 8 64 8 54 7 16662 50	72 8 64 8 64 8 17280 50	72 8 65 8 64 8 17550 49	75 8 64 8 64 8 18000 48	81 9 72 9 72 9 17280 50

17 Teeth in the Balance-Wheel.

Second Wheel 48 6 Third Wheel Pin. Third Wheel 45 6 Contrate Pin. Contrate Wheel 50 6 Balance Pin. Beats 17000 in an Hour Seconds 60 in which the 4th Wheel revolves	56 7 45 6 53 6 18020 60	60 8 56 7 52 6 17828 60	64 8 60 8 60 7 17485 60

GW.	SWP.	TNS.	GW.	SWP.	TNS.	GW.	SWP.	TNS.
48	10	6¼	60	10	5	55	12	6 6/11
50	10	6	62	10	4⅚	56	12	6 3/7
52	10	5¾	64	10	4⅔	58	12	6⅕
54	10	5½	48	12	7½	60	12	6
55	10	5 6/11	50	12	7⅕	62	12	5⅚
56	10	5⅓	52	12	6 12/13	64	12	5⅝
58	10	5⅙	54	12	6⅔			

If we divide *double* the product of all the four wheels by the product of all the three pinions, the quotient will be the number of *beats* as given in any of the trains contained in this table; also, if we take the second and third wheels and their pinions respectively, as a compound fraction of an hour, they will give the *seconds* in which the contrate-wheel, attached to the latter pinion, will revolve; thus, $\frac{6}{48}$ of $\frac{7}{56}$ of $60^{m} = 1^{m}$, or 60^{s}, which numbers are consequently proper for a watch that indicates seconds; and if the beats be 18000, or 14400, there will be five or four beats respectively in a second, which are the best trains for measuring fractional parts of a second.

French Repeater.—The mechanism which constitutes the repetition portion of a French, and also of a Swiss watch, was originally employed by Tompion, Quare, and other English artists, and is represented by the various figures contained in *Plate* XLV. of *Horology;* it is easier of construction than the repetition-motion of Stockten, which follows, but is not considered so perfect. We have put the same letters of reference to the detached parts, that stand near them in the larger figures, where they occupy their respective situations; and that the reader may be able to accompany us through our description of the action of the relative parts, we will explain previously the appellations by which the workmen designate these acting pieces. In *figs.* 1. and 2. A denotes the pendant-bow, carried at the end of a cylindrical piece, called the pendant, and the hollow piece, into which it is occasionally pushed, is the pendant-socket; B C D the triple lever is called the crémaillère; E is a fixed pulley; and F the hour-snail, by which the number of hours to be struck by the hour-hammer is limited; H is the star-wheel, to which the hour-snail F is fixed fast; I K is the *tout-ou-rien* and G its spring lying on its plane; L and N are the two sets of teeth, that take hold of the hammer-tails, which strike quarters by double blows; O is one of the quarter hammer-

mer-tails, and Q, or Q 5, the other, which is attached to the hammer that ſtrikes alſo the hours; S is the quarter-ſnail that determines the number of quarters to be ſtruck at any time, when the hour-hammer has ſtruck the hours, and has three ſteps or arcs of different radii, preſented ſucceſſively to the part that acts on, or rather reſts on it; 7, 8, is the looſe piece attached to, and ſecured under the quarter-ſnail S; *a* is the end of the middle lever of the crémaillère; *b* the jumper, that makes the ſtar-wheel jump a whole ſpace when a tooth, in raiſing it, has arrived at its angular point, ſo as to give its ſpring *d* its full tenſion; *e* is the chain made faſt at one end to the crémaillère at D, and after paſſing round the pulley E, attached at the other to a ſecond pulley Z, which is inſerted on the arbor of the repeating main-ſpring, *f* is the quarter-piece ſpring, preſſing on a pin in the quarter-piece M; *h* is the quarter hammer-ſpring; *i* its counter-ſpring; *g* the quarter hammer-tail ſpring; *p* the hour-hammer ſpring, and *o* its counter-ſpring; *q* is the hour-hammer quarter tail-ſpring, and *r* the gathering piece or arm fixed on the arbor of the great wheel of the repeating train of wheels, over the pulley Z, that cauſes the quarter-piece to act on the hammer-tails, and is the ſame arbor which we have before called the arbor of the repeating main-ſpring. Theſe are the pieces of mechaniſm that lie under the face of the watch, and appear above the frame when the face is removed, together with the dial-work repreſented by the dotted circles in *fig.* 1, but by unſhaded wheels and pinions in *fig.* 2, that the other parts might not be concealed below them. *Fig.* 3. contains the works under the upper plate of the frame, of which the repetition-train (*petit rouage*) only is ſhaded, the ordinary movement being given in outline. The connection between the pieces exhibited in *figs.* 1. and 2, and the repetition train in the frame, ſhewn in *fig.* 3, is by means of the arbor of the great wheel and its circular rack G, ſeen in this figure, for this arbor protruding above the upper plate of the frame receives on its ſquare the main-ſpring of the repeating mechaniſm, and alſo the gathering-piece *r*, ſo that whenever this main-ſpring, exhibited in *fig.* 4, is wound up, the ratchet on the great wheel, ſeen in *fig.* 5, allows the great wheel to move with it without the reſt of the repeating train; but when the ſpring unbends itſelf, and pulls the chain and attached crémaillère back, the click of the ratchet catches and actuates the whole train, which terminates with a fly on the laſt pinion-arbor, as in the ſtriking part of a clock, and thus regulates the velocity with which the hammers reſpectively ſtrike.

We will now proceed to explain the action of the repeating mechaniſm, which we have deſcribed above, and ſee how the effect is produced by means that are thus apparently complex. When the pendant has been puſhed in ſlowly a ſhort ſpace, the end *a* of the middle prong of the crémaillère, being kept down by the ſmall cock Y, approaches one of the ſteps of the hour-ſnail F, and at the ſame time pulls the chain, by means of the prong D, round the pulley or friction-roller E, and winds up the main-ſpring coiled in the box of pulley Z, at the ſame time making the gathering-piece *r* retrograde from its pin, inſerted into the quarter-piece: in *fig.* 1. this motion is juſt commencing from a ſtate of quieſcence; ſuppoſe now, the retrograde motion of the gathering-piece to take place, while the pendant is puſhed very ſlowly in; and conceive the circular rack on the face of the large wheel within the frame, *viz.* G in *fig.* 3, to be retrograding alſo, as being on the ſame common axis; preſently the end *a* of the third prong of the crémaillère meets with one of the ſteps of the hour-ſnail, and puſhes againſt it; this ſnail, and its attached ſtar-wheel, having their common pivot borne by the *tout-ou-rien* at H, communicate the puſh received by them to this piece, which turning on its centre of motion at I, has its remote or looſe end K carried from its quieſcent poſition, notwithſtanding the oppoſing action of its ſpring; and when conſiderable force is applied to puſh the pendant home, this end K, which forms a detent to the quarter-piece at the points of their contact, quits its hold, and leaves the quarter-piece at liberty to be urged by its ſpring *f*, till its heel-piece *c* drops upon one of the ſteps of the quarter-ſnail, as in *fig.* 2, where it is ſeen reſting on the third ſtep, or ſhorteſt arc. At this inſtant the repeating main-ſpring begins to relax itſelf, and brings forward the concealed rack G, (*fig.* 3.) which had retrograded as many teeth only as the hour-ſnail permitted, before the *tout-ou-rien* was diſplaced; its neareſt tooth to the tail-piece 1, 3, of the hour-hammer R R, catches now this tail-piece, and makes the hammer ſtrike on the circular rim of ſteel, which is ſubſtituted for a bell, and as many blows are given in ſucceſſion, as there are teeth in the rack to fall againſt the hammer-tail, while the repeating train is running down; and during the time in which theſe ſtrokes are going on, the little pin between the hammer-tail ſpring *p*, and its counter-ſpring *o*, may be ſeen moving backwards and forwards, as though it gave the ſtrokes on the counter-ſpring. No ſooner are the hours limited by the hour-ſnail ſtruck, than the gathering piece *r* returns with the relaxing ſpring, till it catches the pin of the quarter-piece, which piece is moveable round a pivot at M, and is now gradually brought back by its pin till one of its teeth N catches O, the tail-piece of the quarter-hammer P, *fig.* 3, and then one of the teeth at L, at the oppoſite end of the quarter-piece, catches Q the upper tail-piece of the hour-hammer, which inſtantly repeats the blow with the hour-hammer, and thus as many double blows are given by the two hammers in immediate ſucceſſion for the quarters, as there are teeth to act on the ſaid tail-pieces, when the quarter-piece begins to return; and this number entirely depends on the ſtep of the quarter-ſnail S, on which the heel-piece falls, when the *tout-ou-rien* is diſplaced; hence if *any* blow is given, *all* the blows that the two ſnails limit will be given, from which neceſſity, the piece *tout-ou-rien*, (all-or-nothing,) takes its name. But leſt the quarter-piece ſhould return by a jerk before the tout-ou-rien has produced its full effect, the angular point *m* of the quarter-piece, in its return, ſlides down the interior face of the *tout-ou-rien*, in oppoſition to the action of its ſpring G, while the ſtrokes of the quarters are making, and arrives at the point K, at the termination of the ſtrokes, thus performing the office of a train and fly, after which the *tout-ou-rien* reſumes its quieſcent poſition, and its end becomes a detent to the quarter-piece. It is not neceſſary to deſcribe the action and re-action of the two hammer-tail pieces, which perform their operations, as in the ſtriking work of a clock heretofore deſcribed; but it may be proper to ſhew how the lower tail-piece 3, 4, of the hour-hammer is detached from the rack G, *fig.* 3, while the quarters are ſtruck, by means of the upper tail-piece Q acting with the teeth of the quarter-piece at L only; this will be beſt underſtood by a reference to the detached figures in the group denoted by *fig.* 6, as will alſo the action of ſeveral other parts, which we have deſcribed and explained as being in their places in *figs.* 1 and 2; the three pieces marked Q 5 are the ſame quarter tail-piece ſeen in different views, 2 C 1 R, is a part of the hour-hammer, and its arbor 6 paſſes the ſocket of the piece 3, 4, which we have called the lower tail-piece of the hour-hammer, before it receives the upper tail-piece Q on its ſquare;

 now

now the part 3, 4, is that which takes hold of the circular rack G in *fig.* 3, and is thus occasionally detached from the said rack; *viz.* its pin 3 ascends through the upper plate of the frame, so that its superior end is visible at 3 both in *fig.* 1. and *fig.* 2, and falls in the way of the extreme end of the quarter-piece, which, on its return from the quarter-snail, catches it and turns the piece 3, 4, round the central arbor 6 of the hour-hammer, and thereby takes the end 4 out of the circular rack, while the quarters are being struck, but whenever the hours are to be struck, the proper spring restores the due position of the tail-piece. As the repeating train of five wheels, and as many pinions, are introduced to give motion to the regulating fly, it is of no consequence what the numbers of their teeth be, provided they be duly proportioned to act smoothly, and to produce the requisite velocity for the proper intervals between the successive strokes. The dial-work for hours and minutes is the same as in any ordinary watch, except that the quarter-snail is attached to the cannon-pinion, and lies under it, so as to partake of its hourly motion, together with that of the minute-hand, shewn in dots, as being above the face, the piece, however, in *fig.* 6, denoted by the figures 7, 8, and called the loose-piece, (or surprise,) is also fast by friction to the same hour-arbor, and revolves contemporaneously with the snail and minute-hand, and when its pin 8 meets with one of the points of the star-wheel H, it moves it forwards until the angular point on the face of the jumper *b* has passed an opposite point of the star, when it will jump or move at once the remainder of the space; in this star are twelve points, and as the hour-snail, which has twelve steps, is made fast to it, the snail also jumps to the succeeding step once every hour, while the three steps of the quarter-snail follow one another by a constant slow motion, keeping pace with the minute-hand. Hence the *times* at which the respective hours and quarters are to be struck, corresponding with the positions of their proper snails, are guided by the common dial-work, and when once they are duly adjusted, a motion given to the minute-hand, by a suitable key, will always keep both the snails in their requisite positions for regulating the number of hour and quarter strokes, that the face of the clock has indicated by the hour and minute-hands; and in the same way the quarters even of the minute might be repeated, if such addition were deemed desirable. In our *figs.* 1 and 2, we have put the characters of the hours on the rim or edge of the case, as the face is removed, merely to shew how the hands, pointing to the divided spaces, are connected with the snails of the repeating mechanism. From this explanation, it will appear that the movement of the watch is not at all affected by pushing in the pendant, nor yet by the motions of the repeating parts, otherwise than as the heel of the quarter-piece falls against the quarter-snail carried by the cannon-pinion, and at the moments when the loose-piece, under this snail, moves the star at its hourly period; but trifling as these obstacles may appear in a common watch, they are seldom, if ever, introduced into a chronometer.

In the construction which we have here described, a large semi-circular rack and pinion are sometimes substituted for the chain and pulleys, in which case the rack is attached to the crémaillère, and the pinion to the arbor of the repeating main-spring; and it is obvious that such a substitution will remove the objection to the liability of the chain's breaking, and the consequent derangement of the works.

English Repeater.—The construction of the repeating motion, called, after the name of its inventor, a *Stockten* motion, differs in many respects from and is very superior to the original repeating motion, which, with a very little alteration in the mode of arranging its parts, is now generally known by the term *French* motion: this appellation is however improper, since the repeating watch is indisputably an English invention, the merit of which was disputed by Tompion, Quare, and other English watch-makers of celebrity of the last century.

Stockten was an Englishman, but his history, like that of many other ingenious men, is so little known to posterity, that even his sponsorial appellation is lost, and his birth-place unknown; all that can with any certainty be recorded respecting him is, that he lived in London, and worked for the celebrated Mr. George Graham, watch-maker and F.R.S. the successor to Mr. Tompion, the motions of whose repeaters were always made upon this construction. The houses of Mudge and Dutton, Fleet-street; of Ellicott, Royal Exchange; and of Vulliamy, Pall-mall; who, for many years after the death of Mr. Graham, were the principal makers of repeaters in London, constantly employed this construction of motion; and it is now generally made use of by all the London watch-makers in the manufacture of their best repeaters.

To enumerate very briefly the advantages of this repeating work, its main-spring is wound up by a rack and pinion; from its construction the action of the parts is uniform and gradual, and not depending on several springs, whose actions interfere with each other; and moreover it is susceptible of being made to strike the half-quarters, without inconvenience or additional work.

To understand the general action of this repeating motion, it is necessary to be well acquainted with its construction, the detail of its parts, the manner in which the different pieces come together, and their separate actions. The pieces composing the pendant work, and the action of the pushing-piece upon the crémaillère, or, as it is generally termed in this construction of a repeating motion, the *rack;* the brass edge, and its use and mode of being fixed to the pillar-plate; the dial, and the manner of fixing it to the brass edge, and the hands; the repeating main-spring and its barrel; the barrel arbor, and the mode of hooking the spring into the barrel; the repeating train of wheels, or, as they are frequently called, the running train, and the situations of the hammers, relative to the wheels between the plates, and their respective uses and actions are all so nearly the same as in the common motion, previously described, that any further description becomes unnecessary: the ratchet, click, and click-spring of the great wheel of the repeating train, are also the same; but the ratchet-wheel G, of twelve teeth (*fig.* 3. *Plate* XLV.) which in the common motion acts upon the hour-hammer, is in this construction of the repeating motion omitted.

In *Plate* XLVI. *fig.* 1. represents the repeating work complete in its quiescent state, with the wheel Q of 48, the hour-snail F, retrograding ratchet P, and wheel of communication R; and also the lantern-pinion *w*, quarter-snail G, and hour-wheel S; by which parts the motion is communicated to the hour-hand, and the hands carried round, perfectly detached from the other parts of the motion.

Fig. 2. represents the repeating work complete, as it appears at the instant of unlocking; the arm *f* of the piece D bearing on the hour-snail F, the arm *y* of the quarter-rack on the quarter-snail G, the little all-or-nothing piece I disengaged from the piece K, and the hammer-tails L and M in a proper situation to be acted upon by the hour and quarter ratchets N and O.

Fig. 3. represents merely the rack A B and pinion C; the piece D; and the two all-or-nothing pieces H and I, in their relative situations to one another on the pillar-plate, the rest of the work being supposed to be taken off.

Fig. 4.

Fig. 4. repreſents the pinion C, and the hour and quarter ratchets N and O, ſeparate in plan, and in profile; and alſo a ſection of the three together.

Fig. 5. repreſents the cannon-pinion *w* ſeen from above, as well as below; and alſo in perſpective, with the quarter-ſnail G attached to it.

Fig. 6. repreſents the wheel Q of 48, the hour-ſnail F, the retrograding ratchet P, and the wheel of communication R, ſeparate in plan, and in profile; and alſo a ſection of them together.

Fig. 7. repreſents the hour-ſnail F on the wheel Q of 48, and the little ſpring *z* in the notch of the ſocket of the hour-ſnail.

The rack A B (ſee *Plate* XLVI. *figs.* 1, 2, and 3.) is the piece firſt put in motion when the watch is made to repeat, and is that by the action of which with the pinion C of twenty teeth, concealed in *figs.* 1. and 2. by the hour and quarter ratchets N and O, the main-ſpring of the repeating part is wound up; this rack may be conſidered as a portion of a very large wheel, whoſe axis or centre of motion is placed, as near as it conveniently can be, to the edge of the watch: this axis is a hollow tube, paſſing through a well fitted hole in the pillar-plate, and pivoted into the upper plate; (the reaſon of its being a tube will be preſently ſhewn;) it is ſet upright in the frame, and conſequently at right angles to the face of the pillar-plate; hence it follows, that the rack, which is alſo fixed at right angles to its axis, moves parallel to the pillar-plate, and is placed as near the plate as it can be, to move freely without rubbing it; the rack is cut into twenty-two teeth. Immediately connected with the rack are the two pieces D and E, called, the piece D the unlocking-arm, and the piece E the quarter-rack: the uſe of the piece D is two-fold; firſt, to determine the number of blows to be ſtruck by the great or hour-hammer, by means of its arm *f*, which, when the watch is made to repeat, comes to bear upon one of the ſteps of the hour-ſnail F; ſecond, to unlock, or, as it is commonly termed, diſcharge the ſtriking. This effect is produced, as will be explained hereafter, by a motion of the piece D peculiar to itſelf. This piece D is attached to the rack, at its greateſt diſtance from its centre of motion, by the ſcrew 1, which ſcrew is tapped into the rack up to a ſhoulder, leaving a plain part equal to the thickneſs of the piece D, and as much more as is neceſſary for the piece not to be bound, between the under ſide of the ſcrew head and the upper ſurface of the rack; and the hole in the piece D, through which this ſcrew 1 paſſes, is made to fit very correctly on the plain part of the ſcrew, upon which it moves as its centre of motion. The quantity of motion of the piece D is determined by a circular hole at its other extremity, through which the axis of the rack paſſes, ſomewhat larger than that axis, which, in order to paſs through the end of this piece D, and for it to act againſt, is purpoſely prolonged above the ſurface of the rack, a very little more than the thickneſs of this ſame piece D: in *fig.* 3. the quarter-rack and the cock *a* are omitted to ſhew the ſhape of this piece.

The quarter-rack E, ſituated above the piece D, has its centre of motion within the centre of motion of the rack A B, or conſidering the centres of motion of both the pieces as lines, they may, under that ſuppoſition, be conſidered as poſſeſſing one common centre of motion: this rack is alſo fixed at right angles to its axis, which paſſes through the tube that forms the axis of the rack A B, the whole length of that axis to the upper plate; the under ſide of this quarter-rack bears upon the top of the tube, or centre of motion of the great rack, which terminates a little above the centre of motion of the piece D, as has been before mentioned; and the upper extremity *e* of the axis of this piece is pivoted into the cock *a*, *figs.* 1 and 2, which cock is ſcrewed faſt to the pillar-plate Y Z: in this manner is the quarter-rack confined in its place between the upper end of the hollow arbor of the rack A B, prolonged through the piece D, as before deſcribed, and the under ſide of the cock *a*. The uſe of this piece is to determine the number of quarters, if any, or the half-quarter, as the caſe may be, to be repeated after the hour: this effect is produced by the action of one, and one only, of the eight teeth at the end of the rack, on the little *all-or-nothing* piece I; and according to the tooth which ſo acts, the watch, after having repeated the hour, repeats the half-quarter, the quarter, or the quarter and half-quarter, &c. as ſhewn by the hands; or if the minute-hand has not paſſed the 7^{m} and 30^{s} after the hour, the firſt tooth of the eight cauſes the repeating to ceaſe immediately after the repeating of the hour is completed. Which of the teeth ſhall act on the little all-or-nothing piece is determined by the advance of the quarter-rack, which is regulated by the ſtep on the quarter-ſnail G, upon which the arm *y* comes in contact, when the watch is made to repeat. The arm *y* is made a ſeparate piece from and fixed to the quarter-rack E, by means of the ſcrew 2, on which ſcrew it moves as its centre of motion, in the ſame manner as the piece D moves on the ſcrew 1, and is kept in its place by the ſpring *g*: the reaſon of this piece being thus made, is to prevent the poſſibility, in the caſe of the watch being made to repeat exactly at the quarter, of the repeating work ſtopping the watch, by the arm *y* holding back the quarter-ſnail, during the ſtriking of the hours: the arm *o*, which is a portion of the quarter-rack, by its action with the retrograding-ratchet P, brings the hour-ſnail F into its proper place to receive the arm *f*, of the piece D. The quarter-rack E is kept in its place by the pin 3, tapped into the piece D, which bears againſt its edge; and is carried forward when the watch is made to repeat, by the action of its ſpring *b*, which is ſcrewed to its extremity the fartheſt from the centre of its motion, and ſet up by its other extremity being confined in a notch in the cock *a*.

The total ſurface of the piece D reſts on the rack A B, and, conſequently when, in the act of unlocking, it moves on its centre, or ſcrew 1, its under face rubs on the ſurface of the rack A B; but the quarter-rack E, on the contrary, is entirely detached from, and does not touch the ſurface of the piece D, its under ſide bearing upon the prolonged arbor of the rack A B, through the hole in the piece D; and is kept down by the cock *a*, which bears againſt the ſhoulder of its upper pivot, as has been before mentioned. There is what is termed, in the peculiar dialect of watch-makers, a *light* between the under ſide of the rack and the pillar-plate, and between the under ſide of the quarter-rack and the piece D; and from their conſtruction, it is evident that they move in planes parallel to one another, and to the pillar-plate.

Having deſcribed the rack, and the parts connected with it, we will next in order proceed to the deſcription of the pinion C, and the hour and quarter ratchets N and O attached to it, and alſo their mode of connection, by which the hammers are raiſed to cauſe them to hit the blows, or to *ſtrike*. The larger of the two ratchet-wheels, N, the one next the pinion, has originally been cut into twenty teeth, of which twelve conſecutive teeth are left; then three more teeth, at an interval apart from each other, and from the laſt of the twelve teeth, equal to the ſpace of a tooth; the remainder of the teeth, that occupied the ſpace from the laſt of the three to the firſt of the twelve teeth, are taken away. The upper ratchet, O, which acts on the ſmall hammer, has been originally cut into ten teeth, of which only four conſe-

cutive

cutive are left. The pinion C fits by a long square hole on the arbor of the great wheel of the running train, prolonged through the pillar-plate, which arbor is pivotted into the upper plate, and the cock *b*, which is screwed to the pillar-plate. The hour ratchet, of fifteen teeth, is fitted to this pinion C, by means of a socket, attached to and forming part thereof; and the upper ratchet, of four teeth, is attached by a hole through its centre, in a similar manner to the under ratchet; and the two are firmly held together, and also to the pinion, by means of two screws which pass through them both, and are tapped into the pinion, as represented in section in *fig.* 4; consequently, whatever portion of a circle the pinion is made to revolve by the action of the rack, the two ratchet-wheels necessarily do the same. It may not be amiss to notice in this place, that the arbor of the great wheel passes through the barrel which contains the repeating main-spring; and that the barrel is screwed to the under side of the pillar-plate, and is connected with it exactly in the same manner as in the case of the common repeating motion, and its operation is the same; but the barrel arbor is not pivotted between the upper and pillar-plates, as in the case of the common motion, but into the upper plate and the cock *b*, screwed to the pillar-plate; and the connection between both the hammers and the motion is entirely above the pillar-plate, through the medium of the hammer-tails, as will be explained.

The pieces next to be described are the two hammers, and their connection with the motion. The two pivots or centres of motion of the hammers are generally placed at equal distances from the arbor that carries the pinion C, and perpendicular to the plates, and, consequently, parallel to that arbor, and to one another; they are pivotted into the frame, and their upper pivots are prolonged through the pillar-plate, to receive the hammer-tails, L and M: there is a pin planted in each hammer, at a short distance from its centre of motion, which also passes through the pillar-plate, in which there are notches or slits forming portions of circles concentric with the centres of motion of the hammers, for these two pins to pass through, as seen in *fig.* 3; it is by means of these pins 4 and 5, *figs.* 1 and 2, which pass into notches, made on purpose to receive them, in the hammer-tails L, M, that these tails, when acted upon by the two ratchets, in their turn act upon the hammers; were it not for this contrivance, the hammer-tails, when impelled by the ratchets, would turn on the pivots of the hammers, as their centres of motion, without raising the hammers. The hammers are kept to their places by the two hammer-springs *v* and *p*, which press against the pins 4 and 5, that pass through the hammers, below the hammer-tails, and as close to the surface of the pillar-plate as they can be, to be free from the surface of the plate: it is by these springs that the hammers, raised by the action of the ratchet-wheels, are impelled forward to strike; and the stronger they are, provided they are not too strong for the power of the main-spring, the louder will be the blow struck. Immediately connected with the hammers are the hammer-tails L, M, through the agency of which the hammers are raised to strike, by means of the two ratchets N and O; these tails require to be extremely well fitted on the upper pivots of the hammers, prolonged through the pillar-plate, which are their centres of motion, though not so tight but that they will move with ease up and down on those pivots; for on this action depends the whole performance of the motion: the part of the hammer-tail, which, by way of distinction, is called the acting lever or pallet, is that against which the teeth of the ratchets act to raise the hammers, the upper ratchet being the smaller of the two; the lever of the quarter hammer-tail is left as much longer than the lever of the other hammer-tail, as is necessary for it to reach the ratchet. To prevent the hammer-tails, when acted upon by the ratchets, from turning on their centres of motion, there is, as has been noticed in describing the hammers, a notch in each hammer-tail, to receive a pin planted in each hammer, parallel to its centre of motion, and which pin for this purpose is made to pass through a circular notch in the pillar-plate.

The next piece to be described is the cross-piece, or piece K. The surface of this piece, when at rest, is in a plane parallel to the pillar-plate, and the piece moves upon two pivots, which act in holes in the two small cocks *c* and *d*, screwed, the cock *c* to the foot of the cock *b*, and the cock *d* to the pillar-plate Y Z. This piece K is maintained in its place, when the motion is at rest, by the end of the little all-or-nothing piece I, which presses against its arm 8, on the one side of its centre of motion, and by the spring *q*, which pressing against the under side of its arm 9, on the other side of its centre of motion, causes it to bear against the little all-or-nothing piece I; the hammer-tail L is maintained in its place, depressed, or raised on its centre of motion solely by the action of this piece K; the hammer-tail M is also depressed in the same manner, but is raised on its centre of motion by the spring *u*, the end of which is made to bear on the under side of the hammer-tail for that purpose; and by the power of this spring it is impelled upwards, and made to follow the piece K, when it is raised by the little all-or-nothing piece I, as before described.

The use of the piece K, when the unlocking takes place, is to depress the hammer-tails on their centres of motion, (the prolonged upper pivots of the hammers) to bring them into the same planes as the hour and quarter ratchets N and O, they being, when the motion is at rest, situated considerably above those planes; and as soon as the striking is finished, to raise up again the hammer-tail L, and by relieving the other tail M from its pressure, suffer it to be raised by its spring *u*. For this purpose the arm 7 enters into a groove, made on purpose to receive it in the hammer-tail L, and the arm 6 is made to bear upon the top of the other hammer-tail M. The action of the piece I will be more fully explained presently.

The pieces next to be described are the large *all-or-nothing* piece H, and the little *all-or-nothing* piece I. The upper surface of the piece H is in the same plane, and it is of the same thickness with the piece D, by which it is acted upon: the upper surface of the piece I is on the same plane with the upper surface of the quarter-rack, and as thick as it can be for its underside to be perfectly free from the springs *v* and *p* on the pillar-plate: it is necessarily required to be of a certain thickness, being acted upon by the two pieces E and H. Both the *all-or-nothing* pieces move on studs, screwed into the pillar-plate, which thus become their centres of motion, the piece H on the stud *r*, the piece I on the stud *i*: it is indispensable that these studs should be perpendicular to the face of the pillar-plate, and the pieces perfectly well fitted upon them: it is moreover absolutely necessary that both the *all-or-nothing* pieces should, in all situations, be parallel to the plane of the pillar-plate; on which account, the piece H, being a thin piece, is fixed to a socket, the hole through which socket is perfectly well fitted to the stud, and the stud is left as high as it can be, to avoid touching the underside of the dial. The unlocking is effected by the action of the piece D on the piece H, in the following manner: when the pendant is pushed in to make the watch repeat, the arm *f* of the piece D comes into contact with the hour-snail, and causes

causes this piece D to move on its centre of motion, (*viz.* the screw 1); its opposite end is then pressed against the extremity of the *all-or-nothing* piece H, and causes that end of the piece to move in a direction outwards; consequently the other end of the piece H, which presses against the little *all-or-nothing* piece I, is moved inwards: the necessary effect of this motion in the *all-or-nothing* piece H, is, from the shape of the two pieces, to cause the little *all-or-nothing* piece to move outwards from under the arm 8, of the piece K; and this action is called the *unlocking* of the motion. The piece I being thus, by the act of unlocking, disengaged from under the arm 8, of the piece K, this piece K, by the power of the spring *q*, depresses the hammer-tails, and brings them into the same planes as the two ratchets, and consequently into a situation to be acted on by these ratchets: after the striking is completed, the piece I is returned by the quarter-rack into its former situation, and with it the piece K, and the two hammer-tails necessarily resume their situations. It is to be observed, that the *all-or-nothing* piece H acts upon the little *all-or-nothing* piece I, very nearly at its centre of motion *i*, and on the end opposite to that which passes under the arm 8, of the piece K.

We come now to describe the wheels that carry the hands, commonly called the dial-work, and their mode of communication, together with the two snails attached to them, which determine the hour and the quarter, or half-quarter, if any, to be struck.

The arbor of the centre-wheel, which makes one revolution in an hour, is prolonged through the pillar-plate, and on this arbor the pinion *w* is fitted, sufficiently tight to be carried round by the wheel, but not so tight as to prevent its turning on the arbor, the upper end *w* only of the socket of this pinion is seen in *figs.* 1 and 2, but the pinion is fully represented, in *fig.* 5, detached from the pieces with which it is connected. The centre-wheel arbor is turned with a shoulder to receive the bottom of the cannon-pinion's socket, and for it to bear against, in order to prevent the extremities of its four teeth, that stand parallel to the arbor of the wheel from rubbing on the surface of the pillar-plate: the upper part of its socket, above the dial, is squared to receive the minute-hand, and the hand fits down to the shoulder, formed, by the reduction of the original cylinder, into a square. At the bottom of this pinion's socket is a collar turned out of the same piece, of which the pinion is made, purposely to receive the quarter-snail; and to this collar in the same plane with the quarter-rack, is the quarter-snail G fixed by two screws. This snail is cut into eight steps, by which the number of blows to be struck is regulated: if the arm *y* reaches the step next the centre, the striking ceases with the repeating of the hour; if it only descends to the next, or second step, the watch, after having repeated the hour, repeats the half-quarter, which is invariably designated by a single faint blow; if it descends to the third step, the quarter only is repeated; if to the fourth step, the quarter and half-quarter; if to the fifth step, the half hour; if to the sixth step, the half hour and half-quarter; if to the seventh step, the three-quarters; and if to the eighth step, the three-quarters and half-quarter. Under the snail is the cannon-pinion, which communicates the motion to the wheel Q of 48, and through it to the hour-hand, and which, from its singular shape, obtains the name of lantern-pinion. This pinion is of a very peculiar construction, and consists of four upright, equidistant, cylindrical teeth, attached at one end to the under side of the collar, and made out of the same piece of steel that forms the socket and collar above-mentioned, as seen in *fig.* 5.

Above the cannon-pinion, and resting on it, is the hour-wheel S, which makes one revolution in twelve hours; and this wheel carries the hour-hand by means of its socket, which fits on the wheel's socket prolonged through the hole in the centre of the dial. To explain the mode by which this wheel is made to perform one revolution in twelve hours, it will be necessary to describe the wheel Q of 48, so called from being cut into 48 teeth; the hour-snail F, with its ratchet P; and the wheel R of communication to the hour-wheel. These four pieces have one common centre of motion, which is a stud *x*, screwed perpendicularly into the pillar-plate, similar to the studs *r* and *i*; the wheel of 48, to which are attached the other three, is placed as close as it can be to the plate to turn freely. To the centre of the wheel is fixed a long socket, well fitted to the stud, by which means the perfect parallelism of the wheel's plane to the surface of the plate is preserved: from the face of the wheel upwards, equal to the thickness of the hour-snail, this socket is left of a considerable diameter, equal to the hole in the centre of the hour-snail; for on this part of the socket it is that the hour-snail fits, but not so tight as to prevent its turning easily on the socket, while its underside bears on the upper surface of the wheel: above the surface of the snail the socket is reduced in diameter to the size of a common socket. The ratchet P is fastened to the hour-snail by two screws, and thus becomes one piece with it; the centre of the ratchet being cut out a quantity equal to about half its diameter, (see *fig.* 6,) and it is so placed on the hour-snail, that the small circle thus cut out is concentric with its centre of motion. The wheel of communication R (see *fig.* 6.) forms the last of the four; it fits tight, by a hole through its centre, on the socket of the wheel of 48, and on its under side a collar is left, which fits, but not tight, into the space formed by the cutting out of the centre of the ratchet, and which collar bears on the shoulder of the large socket above-mentioned, that is formed by the reducing it from the size, at which it passes through the hour-snail, to the smaller size: in this manner the hour-snail and ratchet are confined between the wheel of Q 48 and the wheel of communication R. To ensure the snail being carried round once in twelve hours by the wheel of 48, and its being preserved in its relative situation with respect to the hour-hand, so that the hour struck shall accord with the hour shewn; and also to ensure the safe bearing of the arm *f*, of the piece D, on the step of the snail, there is a notch in the thick part of the stud on which the snail is fitted, and a corresponding long slit, commencing at the centre of the snail, and extending nearly to its circumference; in which slit is a straight spring *z*, that takes into the notch in the socket, (see *fig.* 7.); the effect of this contrivance is twofold: first, by the action of the spring in the notch it preserves the snail, when not acted upon by the arm *o* of the quarter-rack E, constantly in the same situation relatively to the wheel of 48; and secondly, it allows of its being moved on its centre when required, and at the same time regulates the quantity of that motion by the width of the notch in the socket. The case in which the hour-snail is required to turn on its centre, independently of the wheel of 48, is, when the minute-hand having just past the 60^{m}, and consequently the hour only being required to be struck, there would, without this peculiar additional motion of the snail, be danger of the arm *f*, which cannot be a line, but must possess width as well as thickness, not coming down safe on the step of the snail it ought to reach, but, by being stopped by the preceding step, of its causing the watch to repeat one hour less than it shews; to prevent this, the arm *o*, of the quarter-rack, when the watch is made to repeat exactly at the hour, and for

for some few minutes after, coming into contact with the ratchet, which is situated in the same plane as the arm *o*, causes it, and also the snail, to advance a sufficient quantity to ensure the safe bearing of the arm *f* on the snail, and consequently the correct striking of the watch: this effect, from the construction of the parts as just described, is produced, without disturbing either the wheel Q of 48, or the wheel of communication R, and consequently without moving the hands. But it yet remains to explain the mode in which motion is communicated to the hour-hand: the cannon-pinion of four teeth, or pins, revolving with the centre-wheel once in an hour, necessarily causes the wheel of 48, in which it acts, and with it the wheel of communication, to revolve once in $\frac{48}{4}$, or twelve hours; and the wheel of communication acting on the hour-wheel, so called because it carries the hour-hand, is of the same size and number of teeth as itself, and therefore causes it and the hour-hand to make one revolution in twelve hours.

The several parts of the motion and their respective uses being now described in detail, it remains lastly that we describe the general action of the whole.

Let us suppose the watch made to repeat in the usual manner, by pushing in the pendant at the three-quarters and a half-quarter past seven o'clock, the rack A B, *fig.* 2. by the pressure of the pushing-piece, is carried forward until its further advance is stopped by the arm *f*, of the piece D, reaching the seventh step from the exterior point of the hour-snail F; at the same time the rack, by its action on the pinion C, winds up to a certain degree the main-spring; and the hour and quarter ratchets N and O, being attached to this pinion, are carried forward with it, or rather, relative to the shape of the teeth of those ratchets, are carried backwards with it: the piece D, necessarily advancing with the rack, being immediately attached to it, disengages the quarter-rack E, previously kept in its place by the pin 3, which quarter-rack being disengaged, is by the power of its spring *b* immediately brought forward after the rack A B, until it is stopped by its arm *y*, reaching the quarter-snail G; but in this case, the watch being to strike the three-quarters and the half-quarter, the advance of the quarter-rack is almost immediately stopped by its arm *y*, coming against the step, the farthest removed from the centre of the quarter-snail G: the instant the arm *f*, of the piece D, has, by its pressure against the hour-snail F, acted sufficiently upon the large *all-or-nothing* piece H, the unlocking is effected. By unlocking is meant that portion of the total action of the motion, every time the watch is made to repeat, which consists in the hammer-tails being set at liberty to descend into the same planes the two ratchet-wheels are in. By the action of the piece D, with the *all-or-nothing* piece H, which in its turn acts on the little *all-or-nothing* piece I, this piece I is thrown from under the piece K; and this piece K, being no longer supported by the little *all-or-nothing* piece I, has its two arms 6 and 7, by which the situation of the hammer-tails, on their centres of motion is determined, depressed by the action of the spring *q*, on its arm 9, until the two hammer-tails are brought into the same planes as the two ratchets N and O, and are thus placed in a situation to be acted upon by those ratchets, and through them the hammers. The power of the blows struck by the hammers depends on the strength of the hammer-springs *o* and *p*; which power is communicated to the hammers, by the springs bearing against the pins 4 and 5, planted in them, which pass through the pillar-plate into the hammer-tails: when by the action of the ratchet-wheels on the hammer-tails the hammers are raised, these pins press against the hammer-springs and continue so to do, thus gradually increasing the power of the springs until the hammer-tail escaping from the tooth of the ratchet, the hammer is by the strength of the spring suddenly thrown forward, and made to strike. The friction of the running-train and of the parts of the motion, added to the resistance of the two hammer-springs, is the whole power the repeating main-spring has to overcome; and the stronger these springs are, provided they are not too strong for the power of the main-spring, the louder will be the blows struck. The number of the teeth of the ratchets that are brought to act on the hammer-tails, is the same as of the hour to be struck, which are determined by the two snails. The unlocking being thus effected, the act of striking commences; the power by which the repeating main-spring was wound up, being removed, the spring immediately uncoils, and returns into its former state, carrying with it the pinion C, the two ratchets N and O, and the rack A B; the hammer-tails L M, having been depressed, and from the action of the arms 6 and 7 of the piece K upon them, continuing in the same planes with the ratchets, are necessarily acted upon by them, and thus is the striking of the hours and quarters effected. The instant the striking is completed, the rack A B continuing to return overtakes the quarter-rack E, and by means of its pin 3, carries it with it: at the moment the quarter-rack begins to move, one of its teeth, which tooth is regulated by the quarter or half-quarter that has been struck, acting on the pallet of the little *all-or-nothing* piece I, this piece is brought back to its former situation, and through it the piece K, and the hammer-tails; and all the pieces of the motion return by the power of the repeating main-spring, into the same situations they were in before the watch was made to repeat.

The *mode* by which, in this construction of repeating work, the proper number of quarters, and the half-quarter, if any, as shewn by the hands, is struck, is peculiar to itself, and requires to be particularly explained. The hour-snail and the great ratchet are so proportioned to one another, that, as has been before observed, according to the step on the snail, the arm *f* of the piece D descends upon; so is the number of teeth of the great ratchet sent back, previously to the unlocking taking place, to engage as soon as the unlocking shall be effected, in the hammer-tail of the hour-hammer: thus, suppose the watch to repeat *twelve*, the arm *f* descends to the twelfth or lowest step of the hour-snail, and at the same time the ratchets revolve a sufficient quantity for the twelve successive teeth, that act on the great hammer-tail, to come into action: if, on the contrary, the watch were required to strike *one*, the arm of the rack would descend to only the first or exterior step of the snail, and the ratchet would revolve a sufficient quantity for the first only of the twelve teeth to come into action with the hour hammer-tail. It is evident, from the above description of the action of the twelve teeth of the great ratchet that act on the hour hammer-tail, that the three teeth in the same wheel which, conjointly with the small ratchet of four teeth, are employed to strike the quarters, must be so situated relatively to the twelve teeth that strike the hours, that when the watch is made to repeat they will precede those teeth, in their advance towards the hammer-tails; otherwise the quarters would be repeated before the hours; for if the action of these pieces is attended to, it will be seen, that, in the act of winding up the repeating main-spring, as many teeth of the two ratchets will pass under the hammer-tails, as are to act on them before the unlocking is effected: consequently, the tooth that first passes under the hour hammer-tail would be the last to act upon it in returning; and every time the watch is made to repeat, the three teeth of the great ratchet,

ratchet, and the four teeth of the ſmall ratchet, muſt, by being in advance of the other twelve teeth of the great ratchet, be carried forward, and ſo ſituated, if not prevented by ſome external cauſe, as invariably to occaſion the watch to repeat the three-quarters and half-quarter, after the hour, every time the watch is made to repeat. Such effect is prevented taking place by the action of the quarter-rack: the extremity of this rack is cut into eight teeth; (the acting face only of the firſt tooth being cut, and the remainder of that tooth left ſolid, to inſure the ſafe action of the little *all-or-nothing* piece I, when the watch has finiſhed ſtriking,) and theſe eight teeth correſpond with and are proportionate to the eight ſteps in the quarter-ſnail; if the hour only is to be ſtruck, the quarter-ſnail is ſo ſituated with reſpect to the quarter-rack, that the arm *y*, of the latter, deſcends to the deepeſt ſtep in the ſnail, allowing the firſt tooth of the eight juſt to paſs the ſhort lever, or, as it is frequently called, *pallet* of the little *all-or-nothing* piece I, and, from the conſtruction of the parts, the quarter-rack is in ſuch a ſituation, relative to the great rack, that the latter, through the medium of the pin 3, coming into contact with it, at the inſtant the laſt blow of the hour is ſtruck, carries the quarter-rack with it, and cauſes it to return into its original ſituation: now the effect produced by the great rack, carrying the quarter-rack back, is, to occaſion the latter, by the action of its firſt tooth on the little *all-or-nothing* piece I, to bring that piece ſuddenly into the ſame poſition it was in before the ſtriking was diſcharged, and thus to raiſe the piece K, and conſequently the hammer-tails, and to diſengage them from the three teeth of the great ratchet that ſtrike the quarters, and alſo from all the teeth of the ſmall ratchet, which along with the rack-pinion, all now return into their original ſituation.

We are indebted to Mr. Benjamin Lewis Vulliamy, of Pall Mall, clock and watch-maker to the King and Prince Regent, for this minute deſcription and accompanying plate of the Stocken repeater, which has never before been deſcribed, and for which, therefore, we beg to acknowledge our obligation to him.

Elliot's repeating Watch.—A new, cheap, and ſimple apparatus for repeating the hours and quarters was contrived by J. M. Elliot of Ayleſbury-ſtreet, Clerkenwell, and publiſhed in Nicholſon's Journal (vol. vii. 8vo. Series, p. 157.), as being applicable to either clocks or watches. The ſketches that are given in the original drawings are not calculated to give a clear conception of the connection of the parts employed; and, therefore, we have given ſuch a new arrangement of the figures, as we truſt will enable our readers to comprehend the conſtruction and action of Elliot's mechaniſm, as applied to a watch. *Fig.* 1. of *Plate* XLVII. of *Horology*, exhibits the repeating work of Elliot's watch, publiſhed in 1804; and *figs.* 2, 3, 4, and 5, ſhew the parts detached, with the ſame letters of reference as in *fig.* 1. In this conſtruction, the uſual apparatus of wheels, pinions, chains, pulleys, and racks, are diſpenſed with; and the acting pieces, inſtead of being ſpread over the ſurface of the upper plate of the frame, are arranged concentrically on the axis of the pendant, which is not puſhed in, but made to turn round to the right or left, accordingly as the hours or quarters are required to be ſtruck; either of which may precede, or one only may be ſtruck, at the option of the wearer. A A B, in *fig.* 2, is called the repeating potance, ſcrewed to the upper plate at *x*, in *fig.* 1, and bears the works ſurrounding the axis of the pendant C D. The portion for ſtriking the quarters, ſeen in *fig.* 3, is attached to the axis *b*; but the part ſeen in *fig.* 2, for ſtriking the hours, is on a tube through which the axis paſſes, ſo that each part will revolve ſeparately; a circumſtance not adverted to in the original deſcription. The quarter-ſnail, S, in *fig.* 1, with its looſe piece, the ſtar-wheel and its hour-ſnail H, the jumper G, and its ſpring I, with the dial-work Y, are ſuch as we have already deſcribed. But the levers or detents M and N, with their ſprings *r* and *t*, act here with the circular racks on the common axis of the pendant, thus; the pendant ſocket D, in *fig.* 2, has a connection with the axis, ſeen in *fig.* 5, by means of the pin *f*, on the axis, taking hold of its projecting piece *a*, which may be called the hour-pallet; *e* is the hour-locking ſnail, in *figs.* 2 and 4, with its projecting pin, placed without or beyond the repeating potance, and fixed on a ſocket that ſurrounds the axis; on which ſocket alſo are fixed the repeating wheel *g*, and its ratchet R, with a ſpiral ſpring, exhibited in *fig.* 4; then while the tail-piece *x*, of detent N, of the hour-ſnail, falls on the proper ſtep of ſnail *e*, to regulate the number of ſtrokes to be made for the hours, the tail-piece *k*, in *fig.* 1, of the hammer V, is caught by the ſloping teeth of the ſtriking-wheel *g*, and raiſes the hammer under the plate of the frame, that ſtrikes a circular rim of ſteel ſurrounding the works, inſtead of a bell; but before theſe ſtrokes will be made, the pendant muſt be turned round by hand gently and regularly, and continued till all the blows are given: this manual turning, therefore, ſuperſedes the neceſſity of a repeating train of wheels and pinions. The ſtriking mechaniſm for the quarters is ſimilar in conſtruction to that for the hours, and is ſeen detached in *fig.* 3, where *l* is the pallet; *m*, the locking-ſnail, with its projecting pin to be caught by the pallet in the retrograde motion of the pendant; *o*, the ratchet-wheel, and *n*, its ſpiral ſpring; and laſtly, *p*, the contrate wheel for ſtriking the quarters, by means of the ſecond elongated hammer-tail S, while the hammer has its centre of motion at Z. Thus, when the hours and quarters are both ſtruck by the ſame hammer, as regulated by their reſpective ſnails, the ſprings *n* and *h*, connected with the concentric ſnails and their ratchets, bring back the acting parts to their original ſituations, for repeating the ſame ſtrokes as many times as may be wiſhed, for the purpoſes of either utility or curioſity. It may be neceſſary to notice further, that the rim ſubſtituted for a bell has a notch cut into it, to admit the arbor of the pendant to paſs without obſtruction; and that we give this conſtruction without having ſeen the watch itſelf, and, therefore, without making any remark on its merits or demerits, further than that it appears to have the recommendations of ſimplicity and cheapneſs.

In the ſame year and month in which this watch was firſt deſcribed, the inventor preſented the model of another repeating watch to the Society of Arts at the Adelphi, an account of which is publiſhed in the 22d volume of their Tranſactions, for which he received their bounty of thirty guineas. We have not given a drawing of this ſecond repeater, as being acceſſible to all ſcientific men properly introduced to the Society's rooms, and particularly as the mode of uſing it does not differ from what we have juſt deſcribed, ſo far as the rotatory motions to be given to the pendant, direct and retrograde, are concerned. In this watch the ſnails for the hours and quarters, the ſtar-wheel, dial-work, jumper with its ſpring, and locking detents, are nearly the ſame as in the other; but inſtead of the ſtriking-wheels, ratchets, and ſprings, being on the arbor of the pendant, they are placed on a flat circular rim of ſteel, that revolves, by means of friction-rollers, round the dial-work on the ſame plane, to about one quarter of a revolution. This rim is indented about a quarter of its circumference, and is actuated by a beveled pinion, placed on the inner extremity of the

the pendant's axis, which, by being turned to the right or left, will cause either the hours or quarters to strike first, according to the direction of motion; and pins inserted into the plane of the rim, at the side opposite to the indentation, lift the hammer-tail to strike as many blows as the hour and quarter notches made on the inner edge of the rim, and acting with the second arms of the detents, respectively determine. In this mechanism, a chain wound round a barrel containing a spring, and fixed on the pillar-plate, brings the steel rim back again to its original situation, which entirely depends on the position of the snails.

A patent was taken out for a repeating watch by the same ingenious man, dated 30th October, 1806; but as we have not seen the description thereof, we are unable to say how it differs from either of those which we have just described.

Berrollas' Repeater.—Joseph Anthony Berrollas of Denmark-street, in the parish of St. Giles in the Fields, London, took out a patent for what he calls an *infallible* repeating watch, bearing date 31st October, 1808, of which watch we shall give a brief description in this place. In the plate to which we last referred, *fig.* 6. shews the repeating portion of Berrollas' watch, in a state of action; *fig.* 7. shews the calliper of the common movement, hammer, and ring used for the bell; and the detached pieces of the repeating portion are represented singly in the group of *fig.* 8. Like Elliot, Berrollas founds his pretensions to public approbation on the simplicity of his contrivance, and on the consequent cheapness, where the repeating motion by wheels and pinions is dispensed with, and where one hammer only is necessary for striking both the hours and quarters. Though we have not seen the watch we now undertake to describe, yet as it has some peculiarities in its construction, not quite so intelligible as could be wished in the description given in the Repertory of Arts, vol. xiv. p. 364, we will venture to deviate a little from the author's own account. The outside of the watch resembles common watches, except in the pendant, which is mounted with a button, consisting of two parts, C and X: the lower one, X, does not move, and the upper one, C, having an endless screw annexed to it, turns round and comes out to the extent of four turns, and is cut into four turns and a half. The upper part of the button C, being turned to the right, screws off from the lower part X, and operating upon the hour-rack A, can be continued to be unscrewed until it has struck the hour which the hand indicates, when it cannot be further unscrewed. The same part C, being afterwards screwed to the left, to bring it back again to join the lower fixed part X, operates upon the quarter-rack B, and quarters are struck in the same manner as the hours, until the part C is completely joined to the part X. The piece W draws piece B back to its former station. The motion is composed of three principal parts, A, B, and C: A contains the hour-rack, B the quarter-rack, and C the pendant and endless screw. The piece C, turning on itself, ascends perpendicularly, and is kept in a proper direction by the piece E, which performs two objects. The interior of it forms the catch-work of the screw, whilst the exterior is fixed by two screws on the pillar-plate; and when the piece C is turned, it acts upon the piece A, and gives it a circular motion, first by means of the piece D D, whose interior is caught in the notch at the extremity of the piece C, while the exterior part of it is caught in the piece A; secondly, by the piece F, which holds the piece D D in a groove; thirdly, by the piece G, which is fixed to the pillar-plate with three screws, and under which the piece A is fixed by means of a pivot, on which it moves. The piece A, being thus moved, catches by means of twelve teeth, cut in its interior part, the piece H, which puts in action the hammer Q, that strikes on the bell-spring R, fixed to the pillar-plate S, as seen in *fig.* 6.

The piece A passes under the piece K, which is a brass bar with two screws to keep piece A from rising. In order to give a free and a steady motion to the piece A, it is operated upon by a pivot fastened to a spring U, placed on the inside of the pillar-plate; which pivot, passing through a hole in the pillar-plate, causes a steady friction under the teeth of the piece A. The piece A is regulated by the star N and hour-snail M, in the common way, with a jumper and spring, when the hours are struck; also the quarter-snail P, the quarter-piece B, and its spring O, regulate the same, when the quarters are struck, through the agency of the forked piece J, which is on the same arbor as the tail-piece H and hammer. The tooth V, on the piece A, falls on one of the steps of the hour-snail, and determines the number of strokes for the hours, when A is turned one way round, and the heel-piece of the quarter-piece near P falls on the quarter-snail, when the motion is given to A in the contrary direction, and thus determines the strokes given for the quarters, while two springs keep the tail-pieces H and J in their respective places; one of which springs, L, is seen upon the plate, and the other is fast to the piece K, not seen. Thus the striking in this watch is produced by manual pressure, as is done in Elliot's watches, and the mechanism differs from that at the rooms of the Adelphi Society only in these respects:—that the motion is produced by a screw, instead of a pinion; and the piece A moves round a pivot at the end of the cock G, instead of being formed into an exact ring to move within friction-rollers.

Alarum, 'larum, or *warning Watch.*—The watches which we have above described under the denomination of *repeating* watches, can be useful only to persons who are awake, and, therefore, do not answer the purpose of giving previous notice of the approach of any particular hour and minute, at which it may be required to be roused from sleep. This purpose is usually effected by a 'larum clock; but we will now describe how the same thing has been done by some additions to a pocket-watch. We will first describe the former method of adding the warning mechanism to a watch, and then explain the construction lately adopted by Berrollas, and secured to himself by a patent. The old 'larum watch has been so well described by Berthoud, in the first volume of his "Histoire de la Mesure du Tems," p. 66, &c. that we cannot do better than give a similar drawing and description, after omitting his account of the ordinary movement.

In the frame of the watch a spring-box is made fast to the under side of the upper-plate, and has a great wheel, ratchet, and click, to wind up by; but the winding is performed by the key inserted on the square end of the spring-arbor, while the box remains at rest. When the great wheel is made to revolve by the ratchet, it drives two other wheels and pinions, which, with it, constitute the warning train, and is in every respect similar to a repeating train, except that there is an escapement-wheel instead of a fly. This train, therefore, will be the more easily understood, from our preceding description of the striking or repeating train. *Fig.* 8. of *Plate* XLVI. exhibits so much of the warning mechanism as appears on the exterior face of the upper-plate, and will suffice to explain the construction and action of all the essential parts, if we bear in mind that a part of the warning train and the spring-box are within the frame, of which this plate forms the cover. The arbor of the concealed spring-box is seen at A, bearing a finger that acts with three teeth cut in the semicircle of the circular piece F, pivotted

pivotted into the cock G. In the present position, the finger carried by the spring-arbor is resting on the plain or unindented part of piece F, and is keeping the spring to its required degree of tension. When the key for winding is applied to the square of this arbor, the teeth of piece F regulate the number of turns that the spring requires to be wound, before it comes to its due tension for driving the warning-train. The wheel *n*, under the cock H, is on the arbor of the pinion driven, within the frame, by the great wheel, and may be called the second wheel of the warning-train; and the pinion driven by it is on the same arbor as the escapement-wheel R, (pivotted also into cock H,) which is the third or last wheel of the train. The teeth of the escapement-wheel, when put in motion by the main-spring urging it through the train, acts with the two pallets *a* and *b* alternately, which are connected by the portions of two small wheels: that represented by *a* is fast to the square end of the hammer-arbor, concealed in the frame; and the other, *b*, turns on a fixed stud on the plate. The forked piece or angular lever 1 2, of the piece *b*, embraces the angular end *d* of the warning-detent *d f* 4, which is moveable at *f*, while the remote end 4 presses on a spiral plate *p*, made fast to the wheel of the hours C, by the action of the spring *q*. Now as plate *p* revolves once in twelve hours, and has only one step at *o*, the end of the spiral, it is obvious that, when this step comes to the angular point 4 of the detent, this point will drop suddenly towards the centre of the hours-wheel, and at the same instant the angular end *d* will quit the fork 1 2 of the piece *b*, which will now be at liberty to obey the force of the escapement-wheel R, exerted on the pallets *a* and *b* alternately; and the concealed semicircular hammer, on the arbor of pallet *a*, will strike at both ends alternately against the sonorous ring that produces the warning noise, until the finger of A has gathered up all the teeth of piece F, and is again arrested on the opposite point of the diameter beyond the last tooth. At *x* the piece *b* has a tail-piece, which vibrates between the elastic prongs of the fixed fork P, and thus brings back the hammer after each stroke to the right and left; and the frequency and loudness of these reiterated strokes are competent to rouse any person, not too lethargic, from a state of sleep. A small dial-plate lying over the centre of the watch-face, and divided into twelve hours and parts, is so connected with the spiral-plate *p*, that turning this dial to a pointer, made on the short end of the hour-hand, will put the step *o* into a proper situation for making the point 4 of the detent fall at the time required, and will consequently produce the alarm at the time for which the small dial is thus adjusted.

Warning Watch by Berrollas.—In the year 1810 we find J. A. Berrollas residing in Coppice-row, Clerkenwell, and taking out a patent, on the 26th of May of that year, for a warning watch of a new construction, which we will next proceed to describe; but the description given of this invention in the Repertory of Arts, &c. is so imperfect, at least to us so unintelligible, that we have been obliged to alter both the drawings and explanation, before we could make the mechanical contrivances understood. The reasons which seem to have induced Berrollas to attempt a new construction of a warning watch, were the inconveniences attending winding up, setting to time, and turning the small dial-plate, all which he professes to have obviated. We have shewn the different parts of this mechanism in several figures in *Plate* XLIV., which we shall now proceed to explain in our own way. In *fig.* 10, *a* shews the place of the main-spring, and *b* the fusee of the ordinary works, which are constructed in the common way, but which are not seen in *fig.* 11, that represents an elongated section of the warning mechanism and dial-work only. At *c* is the arbor of the warning-spring box, of the great wheel of 60 teeth, and of a ratchet-wheel, which is made of steel with 33 teeth, that catch the tail of the hammer *d*, and make it strike against the circular rim of steel, while the spring *e* brings back the hammer after each stroke. This part of the mechanism is not given in the original drawings, nor yet *fig.* 11, which explains the action. As the strokes are made by a wheel on the arbor of the spring-box, it was necessary that it should wind five times round, that the blows might be sufficiently numerous and loud for giving the alarm: hence 165 (33×5) strokes are given at once winding, and the first is the loudest, as being urged by the warning-spring, without a fusee, at its greatest degree of tension; an advantage which the inventor seems to have overlooked in his own account. These parts, and also the pinion *f*, are planted within the frame, as seen in *fig.* 11; but the parts shewn in *figs.* 9, 13, and 14, are on the exterior face of the upper-plate, agreeably to the calliper given in *fig.* 9, but acting together, as more clearly represented in *fig.* 11, where the pivot-holes are supposed to be in a right line, for the sole purpose of explanation. The arbor of pinion *f* ascends through the upper-plate of the frame, and has the wheel *g* attached to it, which drives a second pinion on the arbor of an escapement-wheel *h*; which two wheels are pivotted above into a long cock, screwed to the upper plate; all which positions are clearly seen in *fig.* 11, as well as the mode by which the motion and force are transmitted from the main-spring *c* to the pallets *i*, *i*. The wheel *g* has 45 teeth, the escapement-wheel 20, and the two pinions each six leaves. This assemblage of wheels and pinions constitutes the warning-train; but the warning *detent*, on which much stress is laid by the inventor, remains yet to be described. This detent *k* is seen in two detached positions, in *fig.* 14, where the parts 1, 2, and 3, are taken off, to render their uses more obvious. The dial-work consists of a cannon-pinion of 12 leaves, the wheel *q* of 36 teeth on the stud, its pinion *r* of 10, and the hours-wheel *n* of 40, which are common numbers, that may be thus expressed: viz. $\frac{36}{12} \times \frac{40}{10} = \frac{1440}{120} = 12$. Between the hours-wheel and the cannon-pinion the ring of the detent *k* surrounds the arbor of the centre-wheel, or rather the tube of the cannon-pinion, but not so as to be tight upon it: on the hours-wheel *n* is a pin projecting above and below its plane, as seen in *fig.* 13, against which pin the rim of the said ring is pressed by the spring *t*, as seen in *fig.* 9. Now as the screw 1 takes into the cock 3, made fast to the plate, after it has passed through a hole in the lever of the detent, this screw becomes the centre of motion of the detent, and the pressure of the spring *t* at one end elevates the ring at the other, and with it the perpendicular bar *l*, which reaches to the teeth of the escapement-wheel *h*; so that when the elevation of this bar *l* exceeds the plane of the escapement-wheel, the train will be at liberty to run on, and the hammer will be made to strike a repetition of blows; but while the elevation of the said bar *l* lies in the same plane with the teeth of the escapement-wheel, it will operate as a detent to the train, and silence will be preserved. Above the hours-wheel *u*, and on its tube, revolves a large additional wheel *m*, bearing a circular piece of steel, with an oblong notch cut through it, as seen in *fig.* 13; and the pressure of the upper end of the pin in the hours-wheel is against this circular steel piece at all times, except when it arrives at the said notch, and then it ascends into it by the downward action of the spring

fpring *t*, beyond the centre of motion 1; and at this inftant the bar *l*, afcending alfo, quits the teeth of the efcapement-wheel, and fuffers the alarm to commence, and to continue until the warning-fpring is relaxed. It does not, however, appear by what means the pin of the hours-wheel is difengaged from the oblong hole in the fteel circle of wheel *m*, when the blows of the hammer are finifhed, unlefs the fecond edge of the flit be made floping; and its continuance there muft obvioufly ftop the watch, by preventing the free progrefs of the hours-wheel. Either the mechanifm or the original defcription muft be defective in this part. Within the ring of the pendant is a button, in form of an acorn, which conftitutes the head of a fteel arbor, terminating with a pinion *s*, that actuates a contrate-wheel *o*, which has teeth alfo on the edge, that drive the double pinion *p*; the upper portion of which pinion again impels the large wheel *m*, that carries the fmall hand, and alfo the circular piece of notched fteel. This train is introduced for the purpofe of fetting the warning-hand, which is the fhorteft of the three feen in *fig.* 12, to the requifite hour on the fmall fixed dial, without opening the cafe, and deranging the other hands for fhewing hours and minutes in the ufual way. At the bottom of the acorn there is a fmall ratchet-wheel, with a click and fpring, feen detached between *figs.* 11 and 14, the ufe of which is to allow the acorn to turn only in one direction, while the warning-hand is fet to its place. It is a condition to be obferved in fetting the hour-hand, that it lie exactly over the *pin* in the hours-wheel, and alfo that the warning-hand lie parallel to the *flit* of the fteel circle, attached to the wheel *m*. Laftly, the warning mechanifm may be put into a ftate of action, or of inaction, by moving the button *v*, in the cafe, to the right or left, fo as to fall in the way of the end of the detent *k*, or to efcape it.

Rolling Watch.—After having defcribed various conftructions of watches adapted for the pocket, and contributing to the punctuality with which focial intercourfe is carried on in civilized life, we proceed laftly to defcribe the mechanifm of a watch, which will meafure time only by its defcent down an inclined plane, and which therefore is more curious than ufeful. During the time that various experiments on the laws of moving bodies were made, and applied to the regulation of horological machines by Dr. Wallis, fir Chriftopher Wren, Dr. Hooke, Huygens, Leibnitz, Dr. Halley, fir Ifaac Newton, and others, M. de Gennes and the marquis of Worcefter contrived watches, the former of which would *afcend*, and the latter *defcend* along an inclined plane, by means of a fpring coiled up at the centre of the frame, which relaxed as the rolling motion proceeded; but as no explanation had been given of thefe contrivances in the year 1684, Mr. Maurice Wheeler publifhed an account of a rolling watch, invented by him, in the firft volume of Lowthorp's Abridgment of the Philofophical Tranfactions of London, p. 468, et feq., which account has been copied into other works of fcience; but which we will abridge, agreeably to our own plan of defcription. In *fig.* 15. *Plate* XLIV., let *a b* be the diameter of the circle *a f b h*, ftanding on the dotted horizontal bafe *b m*, on the point *b*. In this fituation, fuppofing the circle to be an uniform plate of metal, it will remain at reft when placed truly vertical, while the line *b m* remains horizontal; but make this line to coincide with the inclined line *n b*, and the circle will roll down this inclined plane, becaufe the vertical line, or line of direction, *d e*, raifed from the point *d*, which will be the new point of contact, falls behind *c*, the centre of gravity of the uniform circular plate; fo that the portion *e f d* becoming fmaller than the portion *e b d*, the centre of gravity will be before the bearing point *d*, and the plate will roll down the plane; and the motion thus produced will have the greater velocity, the more the plane *n b* is inclined to the horizontal line. But if fuch a piece of metal *g* be attached to the portion *e f d* as will form a counterpoife therewith to the larger portion *e b d*, then the plate will have no tendency to roll, but become ftationary, fo long as the inclination of the plane, and the pofition of the additional piece *g*, remain unaltered; but leffen the angle of inclination, or remove the weight *g* towards *f*, and, in either cafe, the plate will actually afcend, till the weight *g*, in its new pofition, balances the new angle of inclination. Alfo, if the angle be increafed, or the weight *g* be brought nearer to *d*, in either cafe the plate will defcend; but as the defcent of the plate down the increafed inclination, by a rolling motion, throws the weight *g* farther from the point of contact *d*, the rolling motion will ftop as foon as the retrograde motion of the weight fhall have produced a counterpoife to the portion *e b d* of the plate in the new inclined plane. Thefe premifes being granted, we are now prepared to fhew how the train of a watch in motion may be made to change the pofition of an appended weight in fuch way as to render that weight a maintaining power during the whole time that a cylindrical box, which contains the weight and movement, fhall gradually and flowly defcend down a correfponding inclined plane, while a pendulous hand or index fhall point out the fucceffive hours and parts during the faid defcent. Let the four wheels and pinions, fhewn in *fig.* 17, be placed like the common train of a watch, with the arbor *x* of the great wheel in the centre of the box, and conceive a balance and efcapement to allow one tooth of the laft wheel to efcape at every alternate ofcillation of the moving balance; then let the weight *w*, at the end of the lever *x w*, be made faft to the faid arbor at the hole *x*, *fig.* 16, as is feen in *fig.* 17; and let its pofition be between *d* and *f*; and the tendency of the weight *w* to come to *d*, will draw round the great wheel, pivotted to the ends of the box, and give fuch motion to the train as will keep up the ofcillations of the balance; but this motion of the great wheel will be fo flow, that it will be fcarcely perceptible when the angle of inclination is fmall; but increafe this angle, or alter the pofition or the magnitude of the weight, and the force will be increafed by which the train is actuated; fo that by one alteration or other, or all, fuch a final adjuftment may be made, that the box will revolve exactly in twenty-four hours. But before this can be duly effected, the train of wheels muft be counterpoifed by a load, attached to the box at the oppofite fide of the centre, fo that there may be one common centre of gravity of all the materials, exclufive of the weight *w*, falling in every pofition of the box, at the centre of motion of the weight *w*; *i. e.* at the arbor of the great wheel round which the box revolves. When this is the cafe, and the angle of elevation of the plane is nicely adjufted by a fcrew A, as in *fig.* 18, the regulated train of the watch will allow the weight *w* to approach *d*, juft as faft as the rolling motion of the box will throw it back, and the equipoife of thefe two contrary actions of gravity, and of the rotation of the box produced thereby, will keep up an uniform flow motion down the inclined plane. In fome conftructions detailed in the "Recueil d'Ouvrages curieux de Mathematique et de Mechanique; ou Defcription du Cabinet de Monfieur de Serviere," à Lyon, 1733, the hours are drawn on the face of the inclined plane, and indicated by the point of contact of the box; but in the watch before us, one end of the box contains the figures from I. to XII. twice over, and a pendulous hand, made heavy below, and revolving loofely on the pivot of the great wheel, always

always points upwards to the passing hour, as represented in *fig*. 18.

In the work of which we have just given the double title, there are various devices for making balls descend on spiral and zigzag planes in a given time, which are again elevated by a spring, and which indicate the time by the number of their descents; but these matters of curiosity are no longer useful as horological machines in the present state of the science of horology.

Musical Watch.—The works of a watch may be applied moreover to give motion to various devices and pieces of machinery, at the same time that the watch performs its own operations; such as actuating the handle of a planetarium, or orrery, exhibiting the motions of any of the celestial bodies by means of its dial-work, or urging the barrel of small musical chimes: but after the detailed accounts we have given of PLANETARY *Machines*, it will only be necessary here to explain how a tune may be played by a musical watch, from which our reader will perceive that the application of similar means to other amusing purposes is equally practicable. In *Plate* XLII. of *Horology*, *fig*. 4. exhibits, on an enlarged scale, the internal disposition of a watch-movement, as seen on the pillar-plate from above, when the other plate of the frame is removed, and the watch laid down on its face; the pillars being supposed to be at the circles N, N, N, and N; the box A contains the main-spring; B is the fusee, with the chain or cord winding round it, as it comes from the circumference of the said box; D is the great wheel, and within it are the ratchet, click, and spring, as usual; E is the pinion of the centre wheel, or hour-wheel, F, and is driven by the great wheel as soon as the main-spring is wound up; G is the pinion on the arbor of the second wheel, and is driven by F; and H, that revolves in the same time with the pinion G, is the third wheel, which wheel again actuates a pinion, I, on the arbor of the fourth wheel, K; which here is not a contrate-wheel, because the balance-wheel I is made for the cylinder escapement, which we described under the article ESCAPEMENT, N° 8. The arbors of these wheels and pinions pointing upwards to meet the eye, appear only in plan; and the dial-work, lying under the plate, is concealed from view. The parts done only in outline exhibit the calliper of the watch, independently of the musical train, barrel, spring, and other appendages, which are *shaded*, for the purpose of distinguishing this portion from the ordinary movement of the watch. In this figure, the calliper of the musical train and spring-barrel may be observed to lie on one side of the frame; but the mode of their action will be better explained by *fig*. 5, which is a section of the frame, in which the calliper is so altered into a straight line, for the purpose only of explanation, that the effect to be produced may be clearly comprehended. In both the figures, 4 and 5, the great wheel attached to the spring-barrel is denoted by the unit 1, and the wheels that follow, with their respective pinions in the musical train, are denoted by 2, 3, 4, and 5, till we come to the regulating fly, 6, placed on the arbor of the last pinion. This fly performs the same office as in the striking part of a clock, or repeating train of a watch; that is, it regulates the velocity with which the main-spring shall unbend itself, and give motion to the barrel in which it is contained; so that if a quick motion be required, a few wheels and pinions only are necessary, and a light fly; but when the motion is required to be slow, there must be a longer train, or a heavier fly, proportioned to the strength of the main-spring. The interior end of the spring is, as in the common main-spring boxes, hooked to a pin on the arbor *d*, and the exterior end to the side of the box, so that turning the arbor *d* round by a key, coils the spring into its state of greatest tension, which is adjusted by the notched piece, or ratchet, *e*, which is held to its place by the click and spring in the usual way, as represented in *fig*. 6. Upon the rim or cylindrical side of the box *a*, containing the main-spring, are inserted various pins in parallel lines, but at unequal distances, according to the frequency of the occurrence of the respective notes to be sounded by the corresponding prongs of the forked piece of steel *b c*, in any given tune which is to be played; and the number of prongs must be equal to the number of musical tones and semi-tones to be produced. In the drawing before us the fork has eight prongs, and the notes are produced by the catching of the pins, inserted into the revolving barrel, on the ends of the prongs, which are elastic and tapered, as well as tempered, to produce the requisite succession of tones that are required in the tune to be performed.

The upper pivots of all the arbors of the musical train are callipered in the cock *b b*, while the lower pivots have their holes on the pillar-plate; and upon this cock *b b* the bent detent, or double lever *f e*, with a hook at *e*, is placed so as to be moveable round a screw at the angular point in the middle: the hook of this detent is kept close to the revolving barrel by the pressing spring *i*, and when the tune is finished, a hole is caught on the side of the barrel, free from the pins, by the hook *e*, which stays the motion till the button *g*, in the case of the watch, is pushed in against the tail-piece of the detent, and frees the hook again from its hole, when the tune is repeated nearly in the same manner that chimes are usually performed. (See CHIMES.) The parts drawn in perspective in *fig*. 6. represent a construction in which the elastic prongs of the musical fork are bent into a curve, so as to occupy less space than in *figs*. 4 and 5, or to produce more powerful tones where the space will admit of an enlargement of their dimensions. But instead of a barrel containing the main-spring, sometimes a cylinder, A, revolving in the cocks *o* and *p*, contains the pins, as is seen in *fig*. 7, where a pinion on the projecting arbor of the cylinder is actuated by the great wheel attached to the spring-box; and this construction is best calculated for a fork with more tones, and consequently for a tune of greater compass. *Fig*. 8. shews how the prong of the fork is caught by the pins in succession, and *fig*. 9. explains how a number of double-pronged forks, *b c*, are separately screwed into a frame, *k*, where the difference in the tones is produced by a corresponding difference in the dimensions of the prongs. The hole in which the hook *e* falls is here in the end of the cylinder, but the motion is not stayed thereby; for the slender spring, pressing against it, lays hold of the fly-pinion, when it follows the detent, and thus stops the part that has the greatest velocity, and least power; whereas considerable strain takes place on the barrel when its motion is stopped by the hook of the detent, as in *figs*. 4 and 6. The arrangement in *fig*. 4. is best suited for a small watch, but does not produce the most audible tones; and is that which is usually concealed in the Swiss *musical seals*, that have been lately introduced into England: but the cylinder in *fig*. 7. is that which the *musical boxes* contain, and which, from its length, is capable of containing two tunes, as well as notes on both the treble and bass clefs. When the elastic prongs are tempered, they are brought to an exact musical scale by grinding with oil-stone dust, and the prongs that require to have their tones much flattened, are made more slender at the end most remote from the cylinder or barrel, where their resistance to motion is diminished, so that the vibrations are rendered less frequent, and the tones less acute. When a second

second tune is played, the cylinder is pushed into and held in a new situation, as in a barrel-organ.

WATCH-*Maker* is a term that might originally denote the *maker* of a *watch* out of the rough materials; but this was the case only in the infancy of the art; for when the demand for pocket-watches became so great as to render the manufacture an object of commerce, the consequent division of labour was soon found to facilitate the execution; and each branch of the trade had its appropriate tools and artisans; so that thousands of families have at length been employed and maintained by their respective manipulations, without interfering with the business of their neighbours, who are equally occupied in their respective departments. In this art, the materials are of very little value in their original state; but the workmanship is so various, and requires such delicacy in the management, that, as has been stated to a committee in the house of commons, materials that did not cost sixpence in the state of ore, have been and frequently are manufactured into a watch that is worth 100*l*. and upwards. This view of the subject induced ministers to withdraw their projected plan of taxing watches, as being, in fact, a tax on ingenuity and industry.

We have anticipated much of the subject of watch-making under the articles we have already referred to in horology, for a watch may be considered as a spring-clock in miniature; and what we have said about calculating, callipering, making, and adjusting the various portions of a small clock, is therefore equally applicable to a watch, except that the balance must be substituted for the pendulum. It may gratify the curiosity of our readers, however, to explain how the labour, we have adverted to, is divided and subdivided into various branches of manufacture; and how persons situated at different parts of the kingdom conspire, without any mutual knowledge of each other, to bring this small piece of mechanism into its finished state.

The best watch-movements are made at Prescot, in Lancashire, by persons called movement-makers, who furnish the movement complete to the London watch-makers.

The following is a list of the principal workmen employed in manufacturing a movement, previously to its coming into the hands of the London watch-maker.

1. The frame-maker, who makes the frame; that is to say, the two plates, the bar, and the potance.

2. The pillar-maker, who turns the pillars, and makes the stud for the stop-work.

3. The cock-maker, who makes the cock and the stop-work.

4. The barrel and fusee-maker, who makes the barrel, great wheel, fusee, and their component parts.

5. The going fusee-maker, who makes the going fusee, (the means by which the watch is kept going while winding up,) when made use of.

6. The centre wheel and pinion-maker, who makes the same.

7. The small pinion-maker, who makes it of wire, previously drawn by another workman, called pinion-wire; the third and fourth wheels, and escapement-wheel pinion; and in the case of repeaters, the pinions of the repeating train of wheels: these are all finished in the engine.

8. The small wheel-maker, who makes the third and fourth wheels, and the wheels of the repeating train for repeating movements, and rivets them to their pinions.

9. The wheel-cutter, who cuts the wheels.

10. The verge-maker, who makes the verge of vertical watches.

11. The movement-finisher, who turns the wheels of a proper size previously to their being cut, forwards them to and receives them from the wheel-cutter, examines all the parts as they are made, to see that they are as they should be; and finally completes the movement, and puts it together.

12. The balance-maker, who makes the balance of steel or brass.

Note.—The brass balance is preferred to the steel balance by some watch-makers, in consequence of the latter being subject to the influence of magnetism: but others prefer the steel to the brass balance, in consequence of the latter being more influenced by variation of temperature than the former.

13. The pinion wire-drawer, who prepares the pinion-wire; this, however, may be considered as only a branch of the trade of wire-drawing.

The plates and wheels are now all made out of rolled brass; but formerly, when it was to be had, they were made of Dutch brass, it being considered preferable to the English.

The movement, in the state in which it is sent to the London watch-maker, consists of the frame, composed of two plates, connected together by four or five pillars, as the case may be, which pillars are riveted to one of the plates, called the pillar-plate; the wheels, consisting of the great wheel attached to the fusee, the second or centre wheel, the third and fourth wheels, the fusee and barrel, potance and stop-work, which latter are attached to the upper plate, (so called in contra-distinction to the pillar-plate,) but the potance screwed to it is between the plates; and lastly, the cock screwed to the outside of the upper plate.

The following is a list of the principal workmen employed on a watch to complete it from the state in which the movement is received from the country.

1. The slide-maker, who makes the slide.

2. The jeweller, who jewels the cock and potance, and, in a more forward state of the watch, any other holes that are required to be jewelled.

3. The motion-maker, who makes the brass edge; and, after the case is made, joints and locks the watch into the case, and makes the motion-wheels and pinions.

4. The wheel-cutter, who cuts the motion-wheels for the motion-maker.

5. The cap-maker, who makes the cap.

6. The dial-plate maker, who makes the dial.

7. The painter, who paints the dial.

8. The case-maker, who makes the case.

9. The joint-finisher, who finishes the joint of the case.

10. The pendant-maker, who makes the pendant.

11. The engraver, who engraves the name of the watch-maker on the upper plate; and also engraves the cock and slide, or index, as the case may be.

12. The piercer, who pierces the cock and slide for the engraver, and afterwards engraves them.

13. The escapement-maker, who makes the horizontal, duplex, or detached escapements; but the escapement of a vertical watch is made by the finisher.

14. The spring-maker, who makes the main-spring.

15. The chain-maker, who makes the chain.

16. The finisher, who completes the watch, and makes the pendulum-spring, and adjusts it.

17. The gilder, who gilds the watch.

18. The fusee-cutter, who cuts the fusee to receive the chain, and also balance-wheel of the vertical escapement.

19. The hand-maker, who makes the hands.

20. The glass-maker, who makes the glass.

21. To these must be added the pendulum-spring wire-drawer,

drawer, who draws the wire for the pendulum-springs, which is almost a distinct trade.

The above are the principal workmen employed in the manufacture of a plain watch; in the manufacture of a repeater, the same workmen are employed, with the addition of the repeating motion-maker, in the place of the maker of the plain motion, who makes the brass edge and motion, and joints and locks or fixes in, which ever way it is done, the watch into its case; and when the repeater is made to strike on bell-springs, the motion-maker makes the springs. Formerly, repeaters were made to strike what was termed dumb; that is to say, a dead blow against the case or cap, or else on a bell, which bell was made by a separate workman, entitled the bell-maker. But the bell-springs have now entirely superseded the old bells. The same spring-maker who makes the main-spring of the watch, also makes the main-spring of the repeating train of wheels.

The springs of a hunting-case are made by a separate workman, called a secret spring-maker. Single cases (not hunting-cases) are frequently made to open with springs: pairs of cases (the old-fashioned box and case) are sprung, lined, and polished by a workman called a springer and liner; the better description of single cases and hunting-cases are polished by a person simply called the polisher: this is sometimes done by women, particularly by the wives of some of the case-makers; and this is the only branch of the trade, probably, in which women are employed in this country.

The compensation-balances for chronometers are sometimes made by the escapement-maker, and sometimes by a separate workman, who confines himself entirely to making compensation-balances.

Plain watch-movements are made of all prices, from 2*s.* 6*d.* to 2*l.* 12*s.* 6*d.*; but repeating movements cost from 2*l.* to 4*l.* 4*s.* each, according to their quality. There are many inferior movements, made as low as 21*s.* a dozen. The lowest prices at which the movements called Lancashire movements are sold, is 7*s.* for plain, and 2*l.* 10*s.* for repeating movements.

The principal London watch-makers order the movements, as above described, of the movement-makers of Prescot, who make them according to the callipers they receive from each maker with their orders. But the ordinary description of movements may be purchased at most of the watch-tool shops in London; one of the chief of which is Fenn's, N° 105, Newgate-street, where every description of clock and watch-makers' tools and engines may also be procured at moderate prices.

At and near Geneva, but chiefly at Locle and Chaux de Fond, in the principality of Neufchatel, the Swiss watches are manufactured in great numbers. In these manufactories women are very generally employed, and the subdivision of labour is carried still further than in our's; and this concurs with the poverty of the workmen, and other causes, to render these watches cheaper than the English manufacturers can make them. The Swiss watches have accordingly supplanted the English in many countries of Europe. In general, the workmanship of the Swiss watches is exceedingly slight.

WATCH-*Making* is the art of making watches. See WATCH-*Maker*.

WATCH-*Tools* are the tools with which watches are usually made, such as vices, pliers, files, hammers, drills, gravers, turning-tools, broaches, turn-benches, balance-tools, spring-tongs, gauges, spring-tools, fusee-adjusting tools, pitching-tools, callipers, screw-plates, burnishers, wire-nippers, screw-drivers, and various others, which would require several plates to represent them, but which greatly resemble the *clock-tools* that we have described and explained by a reference to *Plates* XIX., XX., and XXI., of *Horology*.

WATCH-*Glass*, the concavo-convex portion of a glass-sphere usually employed to cover the dial of a watch. The spheres out of which the watch-glasses are cut are blown of various dimensions, according to the degree of convexity required: the edges are then ground to fit the groove of the cover of the watch-case. There is a superior description of watch-glasses, technically called *bottoms*, which are not portions of spheres, but are flat on the top, the edges only being concavous. Each of these is cut from a separate piece of hollow glass, blown in the shape of a cone, of which the watch-glass forms the bottom; whence it takes its name. The waste of glass is, therefore, considerable, and the flat glasses are consequently much more expensive than the spherical. The method of converting a circular piece of plain glass into a concave, by a heated convex piece of iron, as recommended by Boyle, (see Works Abr. vol. i. p. 135.) is no longer practised in the construction of watch-glasses; but large convex glasses for clock-faces are frequently made in this way.

WATCH *and Ward*, in *Law*, constitute one of the principal duties of constables, who, by the statute of Winchester, 13 Edw. I. cap. 4., are appointed to keep watch and ward in their respective jurisdictions. Ward, guard or *custodia*, is chiefly intended of the day-time, in order to apprehend rioters, and robbers on the high-ways; the manner of doing which is left to the discretion of the justices of the peace and the constable; the hundred being, however, answerable for all robberies committed therein, by day-light, for having kept negligent guard.

Watch is properly applicable to the night only (being called among our Teutonic ancestors *wacht* or *wacta*), and it begins at the time when ward ends, and ends when that begins; for, by the statute of Winchester, in walled towns the gates shall be closed from sun-setting to sun-rising, and watch shall be kept in every borough and town, especially in the summer season, to apprehend all rogues, vagabonds, and night-walkers, and make them give an account of themselves. The constable may appoint watchmen at his discretion, regulated by the custom of the place; and these, being his deputies, have for the time being the authority of their principal. Blackst. Com. book i.

WATCH *Point*, in *Geography*, a cape on the E. coast of Rhode island. N. lat. 41° 13′. W. long. 71° 50′.

WATCHER, NORTH, or *Seven Islands*, a cluster of small islands, in the straits of Macassar, near the W. coast of Celebes. S. lat. 0° 27′. E. long. 119° 33′.

WATCHER, *South*, a small island in the straits of Macassar, near the W. coast of Celebes. S. lat. 0° 3′. E. long. 119° 24′.

WATCHET, an ancient borough, market, and sea-port town, in the parish of St. Decumans, hundred of Williton and Freemanors, and county of Somerset, England, is situated in a fruitful vale on the verge of the Bristol channel, at the distance of five miles E. from Dunster, 20 miles W. from Bridgewater, and 157 miles W. by S. from London. In the year 918, the Danes under Ochtor and Rhoald landed here, but were attacked by the inhabitants, and routed with immense slaughter. The scene of this victory is marked by three large barrows, called Grab-barrows, in which have been discovered several cells, containing human bones, and a variety of weapons anciently used in war. In 987 the Danes returned, and succeeded in laying waste the town, but did no further injury: about ten years afterwards they made a third descent; and in order to remove

remove every obstacle to a future landing, they set fire to the houses, and put nearly all the inhabitants to the sword. This place was one of the vills conferred by William the Conqueror on sir William Mohun, as an appendage to the castle of Dunster. The town of Watchet is now composed of four streets, mostly paved, and containing about 140 houses. It was formerly a place of considerable trade, and had a very large fishery; but now very few vessels belong to the port, and the trade is limited to a trifling freightage of coal, kelp, alabaster, and lime-stone. In the time of queen Elizabeth the harbour was cleaned out, and a pier built at the expence of the Wyndham and Luttrell families, then joint lords of the manor: this pier was repaired at the beginning of the last century, by the care of sir William Wyndham; and a duty granted by parliament on all goods imported, has been applied to making good the expence of further reparations. Two fairs are held annually, and a market weekly on Saturdays. The population, in the return of the year 1811, was included in that of the parish of St. Decumans, which comprehends the town of Watchet, the village of Williton, (whence the hundred derives it name,) and the hamlets of Orchard, Donniford, Kentsford, and Stream, and was then stated to contain in the whole 345 houses, and 1659 inhabitants. The church of this parish, which stands on an eminence about a mile to the south of Watchet, is a handsome structure, a hundred and eight feet in length, and forty-eight in breadth, and consists of a nave, two side aisles, and a chapel, with an elegant embattled tower, eighty feet in height at the west end: in the north aisle are several monuments in memory of the Wyndham family.—Collinson's History and Antiquities of Somersetshire, 4to. 1791.

WATCHING. See SLEEP.

WATEEOO, in *Geography*, an island in the South Pacific Ocean, discovered by Capt. Cook in March 1777; lying in S. lat. 20° 1′ and E. long. 201° 45′; about six leagues in circumference. It is a beautiful spot, with the surface varied by hills and plains, and covered with verdure. Some gentlemen who landed from Capt. Cook's company, found the soil where they passed the day to be light and sandy. But farther up the country, where a different sort perhaps prevails, was seen from the ship, by the help of glasses, a reddish cast upon the rising grounds. There the inhabitants have their houses; for they could perceive two or three which were long and spacious. Its produce, with the addition of hogs, was the same as that of *Mangeea*, which they had last visited. (See MANGEEA.) From circumstances that are recited, it appears that Wateeoo can be of little use to any ship that wants refreshment, unless in a case of the most absolute necessity. The natives, knowing now the value of some of our commodities, might be induced to bring off fruits and hogs, to a ship standing off and on, or to boats lying off the reef. It is doubtful, however, if any fresh water could be procured: for, though some was brought in cocoa-nut shells to the gentlemen, they were told that it was at a considerable distance, and probably it is only to be met with in some stagnant pool, as no running stream was any where seen. The manners of these islanders, their method of treating strangers, and their general habits of life, appear to be much like those that prevail at Otaheite, and its neighbouring isles. Their religious ceremonies and opinions are also nearly the same. The language spoken at Wateeoo was equally well understood by Omai, and by two New Zealanders. What its peculiarities may be, when compared with the other dialects, Capt. Cook was not able to point out. The natives of this island sprung originally, without doubt, from the same stock, which has spread itself so wonderfully all over the immense extent of the South sea; though from a circumstance mentioned by Omai they put in their claim to a more illustrious extraction; for they dignified their island with the appellation of "Wenooa no te Eatooa," that is, a land of gods, esteeming themselves a sort of divinities, and possessed with the spirit of the Eatooa: and this notion Omai informed our voyagers was entertained by some at Otaheite, and prevailed universally amongst the inhabitants of Mataia, or Osnaburg island. It appears that Omai, on landing in this island, found three of his own countrymen, natives of the Society islands; one born at Matavai in Otaheite, another at Ulietea, and the third at Huaheine. By them he was informed, that about twenty persons, of both sexes, had embarked on board a canoe at Otaheite to cross over to the neighbouring island Ulietea; but they were driven by a storm far from their course, and having exhausted their stock of provisions, they passed many days without food or drink. Many of them fell victims to famine and fatigue, and four only survived to reach this island at the distance of 200 leagues from their native abode, by the inhabitants of which the survivors, clinging to their canoe which was overset, were rescued from their danger and distress, hospitably received, and treated with so much kindness, that the three who remained, and who had lived on this island above twelve years, had no inclination to return, though an opportunity now offered itself for this purpose.

END OF VOL. XXXVII.

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